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A Deterministic-Probabilistic Model for Contaminant Transport

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User Manual

Prepared by F. W. Schwartz, A. Crowe

CGS, Inc.

Prepared for
U.S. Nuclear Regulatory
Commission

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A Deterministic-Probabilistic Model for Contaminant Transport

User Manual

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ABSTRACT

This manual describes a deterministic-probabilistic contaminant transport (DPCT) computer model designed to simulate mass transfer by ground-water movement in a vertical section of the earth's crust. The model can account for convection, dispersion, radioactive decay, and cation exchange for a single component. A velocity is calculated from the convective transport of the ground water for each reference particle in the modeled region; dispersion is accounted for in the particle motion by adding a random component to the deterministic motion. The model is sufficiently general to enable the user to specify virtually any type of water table or geologic configuration, and a variety of boundary conditions. A major emphasis in the model development has been placed on making the model simple to use, and information provided in the User Manual will permit changes to the computer code to be made relatively easily for those that might be required for specific applications.

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ABBREVIATIONS AND SYMBOLS

β	Total cation concentration of the solution, meq/ml
C_i	Mass concentration ith constituent, M/L^3
$D_{\alpha\tau}$	Dispersion coefficient, L^3/t
D_L	Longitudinal dispersion coefficient
D_T	Transverse dispersion coefficient
ε	Porosity, dimensionless
f'	Selectivity coefficient
λ	Radioactive decay coefficient, $\lambda = 1/t^{1/2} \cdot \ln 2$
h	Hydraulic head, L
$K_{\alpha\tau}$	Hydraulic conductivity, L/t
K_h	Horizontal hydraulic conductivity
K_v	Vertical hydraulic conductivity
K_d	Distribution coefficient
m^t	Mass at the beginning of the interval, M
m^{t+1}	Mass at the end of the interval, M
R_{ij}	Rate of production of constituent i in reaction j from n different processes, $M/L^3 \cdot t$
σ	Cation exchange capacity, meq/gm
Δt	Time-step size, t
V_α	Darcy velocity in α direction, L/t
v^k	Seepage velocity, L/t
$V^k_{1,2}$	Seepage velocity in 1,2 coordinate directions, L/t

x_{α}	Cartesian coordinate system
$x_{1,2}^{k}$	Intermediate coordinate location, L
$x_{1,2}^{k+1}$	Final coordinate location, L
$x_{1,2}^{'}$	Dispersive displacement in the 1,2 coordinate directions, L
$[Z]_{0}^{1}$	Random number uniformly distributed in the range 0 to 1

A DETERMINISTIC-PROBABILISTIC MODEL FOR CONTAMINANT TRANSPORT

1. INTRODUCTION

The purpose of this manual is to describe the deterministic-probabilistic contaminant transport (DPCT) model. The development of the model and its verification is discussed in Section 2. Section 3 consists of a description of the computer program, including a detailed examination of input and output parameters. Section 4 presents sample data sets and simulation results for two waste repositories in order to demonstrate the operation of the model.

The model documented in this report is designed to simulate mass transfer in a vertical cross-section. It can account for convection, dispersion, radioactive decay and cation exchange for a single component. The model is sufficiently general to enable the user to specify virtually any type of water table or geologic configuration, and a variety of boundary conditions. With the information provided in the user's manual, changes to the computer code which may be necessary for specific applications should be relatively easy to make. A major emphasis in the model development has been placed on making it simple to use. To accomplish this goal, a variety of features in the coding, output or program structure have been included. These features are discussed in the following sections. Although care has been taken to insure that the code is free from errors, we would recommend that users check their versions of the model carefully before extensive use for system-related or other errors.

The hybrid deterministic-probabilistic contaminant transport (DPCT) model presented here has been previously discussed in detail (Schwartz, 1978; CGS, 1980). In concept, the model is similar to a method first developed and applied by Ahlstrom et al. (1977). In addition to its demonstrated usefulness in the evaluation of practical problems, the technique has been extended to the evaluation of the fundamental features of transport in a heterogeneous medium (Smith and Schwartz, 1980).

2. THEORY OF THE MODEL

Convection and dispersion are the primary processes controlling the transport of contaminants within a ground-water system. Convective transport occurs when mass is transported by the movement of ground water in which it is dissolved. Thus, the direction and velocity of the contaminant transport is generally assumed to coincide with that of the ground water. Dispersion refers to phenomena which act to produce solute mixing within a porous medium. The most important causes of dispersion are macroscopic and microscopic mixing and molecular diffusion. The net result of this process is a dilution in the concentration of a contaminant or a tracer at any point in a ground-water system.

Other important processes that influence the migration of radioactive contaminants are ion exchange and radioactive decay. Ion exchange refers to the replacement of ions present in solution with those held by electrical charge at the surface of an exchange mineral. The resulting effect is a reduction in the concentration of the contaminant at a point which is equivalent to a reduction in the actual velocity of transport of the contaminant through the medium. Radioactive decay, expressed in terms of a half-life, describes the spontaneous breakdown of radioactive ions in solution over a period of time. This is another important process which may reduce the concentration of a contaminant in a flow system. However, some high level radioactive wastes, with long half-lives can still pose a serious contaminant threat in regional ground-water systems.

These processes can all be mathematically stated in the following equation, known as the dispersion-convection equation (Bredehoeft and Pinder, 1972):

$$\partial/\partial x_\alpha (D_{\alpha\tau} \partial C_i/\partial x_\tau) - \partial/\partial x_\alpha (C_i V_\alpha) + \sum_{j=1}^{n} R_{ij} = \partial(\varepsilon C_i)/\partial t$$

$$\alpha, \tau = 1,2 \qquad (1)$$

A complete discussion of the significance of the various terms in equation (1) is given by Bredehoeft and Pinder (1973) and Schwartz (1978).

While most models of mass transport through an active ground-water system involve a direct numerical solution to equation (1), it has been found that the hybrid deterministic-probabilistic modeling technique represents a simple, yet versatile and powerful approach. The hybrid method addresses the fundamental problem of describing the spread of a large number of moving reference particles within a region. In practice, the moving reference particles, each with a given quantity of associated mass, are introduced to a region at locations where contaminant inflow occurs. The reference particles are then transported within the region. It is impossible to produce an exact mathematical description of individual particle motion because several factors contribute to the motion. Statistical features of the motion of the particle assemblage do, however, provide a basis for representing an idealized pattern of motion for individual reference particles. Because the position of individual particles is known within the region, one can easily determine the distribution of contaminant mass associated with each particle. This distribution can be expressed simply in terms of concentrations.

Now we will consider in detail how the transport processes are represented in this approach. The actual pattern of ground-water flow is described by the ground-water velocity field. This field is determined in the model by first calculating values of hydraulic head at node points which are defined at the intersection of a set of rows and columns. Head distributions for the region are determined numerically by solving the following ground-water flow equation:

$$\partial/\partial x_\alpha (K_{\alpha\tau} \partial h/\partial x_\tau) = 0$$

$$\alpha,\tau = 1, \qquad K_{\alpha\tau} = 0 \text{ for } \alpha \neq \tau \qquad (2)$$

This equation describes the steady state flow of ground-water flow in a two-dimensional, anisotropic and heterogeneous porous medium. The head and hydraulic conductivity values are substituted into the Darcy equation to calculate a velocity grid for the system. In the model, velocity vectors in the x and z coordinate directions are calculated for each of the triangular elements which comprise a cell. The points are located at the midpoint of the cell in the x-direction and one-quarter of the cell width from both the top and bottom of the cell in the z-direction. It is assumed that the ground-water flow pattern is independent of mass distributions within the system. This assumption is made for nearly all mass transfer models to eliminate the

necessity of iterations. The process of convection is accounted for by a deterministic particle motion during any one time-step.

A velocity is calculated for each reference particle in the region by interpolating values from the two-dimensional grid of velocities. The reference particles move along their respective vectors a distance that is fixed by the magnitude of the time-step and the velocity. This displacement represents the deterministic component of the motion. The new particle position is, in effect, only temporary because the effects of dispersion have not yet been considered. Unlike most other transport models, cation exchange is accounted for by adjusting the mass of contaminant carried by the reference particle and not by decreasing the seepage velocity.

Dispersion is accounted for in the particle motion by adding a random component to the deterministic motion. The character of this random motion is related to the dispersive character of the porous medium (Ahlstrom et al., 1977). Relocation of any reference particle is accomplished by calculating displacements in the two coordinate directions with equations of the following form (Ahlstrom et al., 1977):

$$x_1^{k+1} = x_1^k + x_1' \cdot v_1^k/v^k + x_2' \cdot v_2^k/v^k$$

$$x_2^{k+1} = x_2^k + x_1' \cdot v_2^k/v^k + x_2' \cdot v_1^k/v^k \qquad (3)$$

The parameters are functions of the longitudinal and transverse dispersion coefficients:

$$x_1' = \sqrt{24 D_L \Delta t}\ (0.5 - [Z]_0^1)$$

$$x_2' = \sqrt{24 D_T \Delta t}\ (0.5 - [Z]_0^1) \qquad (4)$$

Readers interested in the derivations of (3) and (4) can refer to an excellent discussion by Ahlstrom et al. (1977). Note that the dispersion process considered here is formulated for an isotropic porous medium. Accordingly, only

two parameters, the longitudinal and transverse dispersivity, are required to characterize the dispersive nature of the medium. Because a practical dispersion model for anisotropic media does not exist, the isotropic formulation, occasionally used as a first approximation, has been extended to anisotropic cases.

What remains now is to explain how the reference particles are defined. Because the reference particles and associated mass represent the contaminant, they are added to the region at the site(s) where contaminants are generated. At the beginning of each new time step, a new set of particles is defined at the contaminant source. These reference particles and those already existing in the region are moved in the manner previously discussed. The rate at which the contaminants enter the system is controlled either by fixing the number of reference particles and adjusting the mass attached to each or as we have done by fixing the mass and adjusting the number of reference particles.

By summing the mass carried by each of the particles in a given cell and by determining the volume of water in the cell, it is possible to calculate contaminant concentrations within the region. When only convective and dispersive processes act, the quantity of mass associated with each reference particle remains constant. However when radioactive decay or cation exchange occurs, it is necessary to decrease the quantity of mass. The quantity of mass associated with a reference particle at the end of a time period during which radioactive decay is occurring is:

$$m^{t+1} = m^{t} e^{-\lambda \Delta t} \tag{5}$$

As is the case with most transport models, cation exchange is approximated as an equilibrium exchange process described in terms of a distribution coefficient. The formulation used here is slightly more general in that instead of the distribution coefficient, the user specifies cation exchange capacity, selectivity coefficient and total cation concentration of the solution. These parameters are related to the distribution coefficient in the following way:

$$K_d = \sigma f' / \beta \tag{6}$$

The only other parameters which influence the exchange process are the porosity and soil bulk density (gm/cm^3). Readers interested in a detailed explanation of how all these parameters control the cation exchange process can refer to Ahlstrom et al. (1977).

The solution of both the ground-water flow equation and the dispersion-convection equation is subject to boundary conditions. Two types of flow boundaries can be assigned to the borders of the region: either a constant head boundary or a no-flow boundary. Ground water recharges to or discharges from the flow system at nodes only where constant head values are assigned. Otherwise, flow is parallel to these boundaries. Mass exits from the region at zones of ground-water outflow. Moving reference particles intersecting a no-flow boundary are simply reflected instead of passing through the boundary.

3. THE COMPUTER PROGRAM

This section presents a brief description of the model. The first part includes a discussion and the structure of the computer program. The second part presents a description of input and output parameters and variables.

3.1 Model Structure

The basic sequence of operations of the model is illustrated in Figure 3.1. First, all input data are read and printed to provide the user with a data echo. Data required for a simulation are a description of the region, boundary conditions and hydraulic parameters, the chemical and physical properties of the contaminant and parameters to control the simulation. In the next step, the nodes, coordinates and elements of the linear triangular finite element grid are constructed and values of hydraulic conductivity, porosity, dispersivity and cation exchange capacity are assigned to the appropriate elements and cells.

Following this step, a linear triangular finite element model, based on the Galerkin formulation (Pinder and Frind, 1972), is used to simulate the steady state head distribution in the region of flow. Only a summary of this procedure is presented below and readers are referred to Pinder and Frind (1972) and Pinder and Grey (1977) for a complete theoretical development and description of this method.

The finite element method provides a direct solution to equation (2) by approximating the differential form of equation (2) by smaller, simpler equations known as shape functions. The shape functions used here are linear because the shape of the element side is linear (i.e. 2 nodes per side). Higher order elements with quadratic or cubic sides are available, but it is felt that the added computer storage and execution time costs did not sufficiently offset the slightly improved solution offered by these functions.

Utilizing the head values, velocity values in the two coordinate directions are calculated at two points within each cell. These Darcy velocity values are calculated by substituting the hydraulic heads and hydraulic conductivities into the Darcy equation. Once the velocities are known, they are

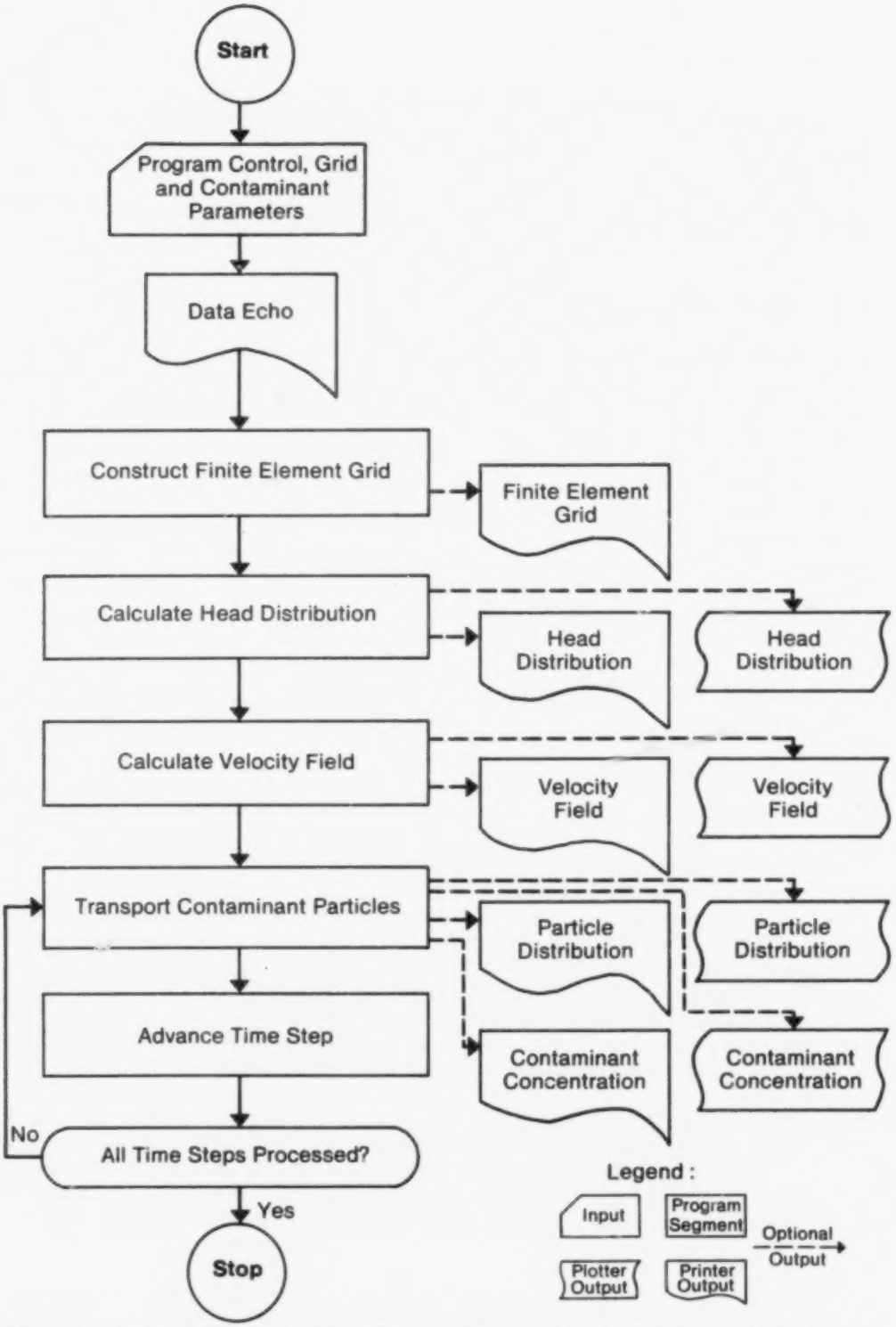


Figure 3.1 Flow chart of the deterministic-probabilistic contaminant transport model.

divided by the effective porosity of the medium to give seepage velocities.

Finally, the mass transport problem is solved by tracking reference particles with their associated mass through the porous medium. A specified number of particles are added to the region at the contaminant source at the beginning of each time-step. By varying the number added during a time-step, it is possible to approximate even quite variable contaminant leaching input functions.

At the beginning of each time-step, a velocity for each reference particle is obtained by linear interpolation from the surrounding nodal values. Each particle moves to an interim position along respective vectors for a distance that is determined by the magnitude of the time-step. The particle is relocated by the random component of motion in the vicinity of the interim position. Care must be taken when choosing an appropriate time-step size. If the step size is too large, moving particles can be moved over very large distances causing particles to end up occasionally at unexpected locations.

The model is designed to loop through the number of time-steps defined by the user. At each time-step, a new particle distribution is calculated. Options are available to output various values on the line printer or to plotting files. Data in this latter form can be kept for plotting or other manipulation.

The model was programmed in FORTRAN IV and run and tested using the AMDAHL 470V/7 computer at the University of Alberta. A complete listing of the programming code is presented in Appendix 3. Basically, the computer program consists of nine parts; the main program, and eight subroutines: FEGRID, HEADS, DBAND, SBAND, VEL, DISPER, RANDU, ESCAPE. These segments are discussed in detail below.

3.1.1 *Main Program*

The purpose of the main program essentially is to read the input data, to fill the arrays with default values, to provide a data echo, and to control the sequence of program steps in the simulation by calling the subroutines. None of

the actual simulation steps are carried out in the main program. The storage required by the arrays is outlined in Appendix 2. For simplicity, it is only necessary to specify array sizes in the main program; the subroutines use execution-time dimensioning of arrays, with estimates of the array sizes calculated in the main program, and passed to the subroutines. A more specific description of the input necessary for a simulation is discussed in the following sections.

3.1.2 *Subroutine FEGRID*

A linear triangular finite element model is used to calculate the steady state head distribution at the nodal points in the cross-section. The finite element grid superimposed over the cross-section is regular (i.e. constant node spacing in the coordinate directions). Because such a simple grid is easily generated within the model, the data necessary for a simulation is reduced considerably. The only information required to construct the finite element grid is the number of rows and columns of nodes, the horizontal and vertical spacing between nodes and the row number of each column which defines the position of the water table.

The subroutine first fills two vectors with the coordinates of the nodes. Nodes are numbered consecutively from 1, starting at the lower left corner of the region and moving upwards to the position of the water table, and then back to the bottom of the next column, repeating the procedure. Constant head nodes are designated as such within the program, in a separate vector.

Following this, the elements are constructed and numbered sequentially upwards from the lower left corner (two elements to a cell) and so on for each column of cells. The element incidences are numbered in a counter-clockwise direction. Finally, the hydraulic conductivity values are assigned to the elements.

3.1.3 *Subroutine HEADS*

Subroutine HEADS calculates the steady state potential distribution for the cross-section. The basic theory of the

finite element method which is used to calculate the head values has been discussed previously. The subroutine requires the input of the finite element grid and the hydraulic conductivity of the elements (both from subroutine FEGRID), the location of the water table and any constant head values. The total head values at each node in the ground-water system can be output on either the line printer, or a disk file (for plotting), or both.

Head values are calculated by sequentially progressing through the finite elements in the grid. For each element, an element conductivity matrix is formed from the element shape functions. The individual element conductivity matrix values are then assembled into a global conductivity matrix, accounting for all elements in the grid. The flux vector, which describes the flow across element boundaries is then assembled. Once these steps are complete, the global conductivity matrix, which is a symmetric and banded matrix, is decomposed using the Cholesky square root method, by subroutine DBAND, to facilitate the solution of unknown head values as a system of linear equations. The equations are solved by subroutine SBAND to obtain the values for the unknown hydraulic head. The head vector is expanded within subroutine HEADS, with the known constant head values inserted in proper sequential order.

3.1.4 *Subroutine DBAND*

Subroutine DBAND uses a form of the LU decomposition, known as the Cholesky square root method, to decompose the global conductivity matrix and, ultimately, to yield the solution for the hydraulic head distribution. This decomposition method is applied to matrices that are symmetrical. A matrix of coefficients of a system of linear equations in such form can be rapidly and efficiently solved. The global conductivity matrix, assembled in subroutine HEADS, is transformed into the upper triangular portion of the matrix (the lower triangular matrix is the same) and stored in the original matrix, thus, economizing storage. A special feature of this particular subroutine is that it is designed to work with banded matrices. In the case of the global conductivity matrix, the width of this diagonal is equal to the bandwidth parameter calculated in the main program.

This subroutine corresponds to Weaver's (1967) subroutine DECOMPOSEBAND and the reader is referred to his work for further details.

3.1.5 *Subroutine SBAND*

Subroutine SBAND accepts the decomposed upper triangular matrix and employs back substitution to solve for the unknowns in a system of linear equations. The terms of the system of equations in matrix form are the decomposed global conductivity matrix from subroutine DBAND, the flux vector from subroutine HEADS and the vector of unknown head values which will contain the calculated steady state head distribution. For a detailed discussion of this subroutine, the reader is referred to Weaver's (1967) write up of his corresponding subroutine SOLVEBAND.

3.1.6 *Subroutine VEL*

The movement of the contaminants is controlled primarily by the velocity of ground-water flow. The velocity field is generated in this subroutine from the head values calculated in subroutine HEADS and hydraulic conductivity values of the various cells. The velocity values calculated are Darcy velocity values, discussed in detail in the previous chapter.

Velocity values in both coordinate directions are calculated for each element from the surrounding nodal head values. Thus, velocity values are calculated for two points in each cell. These points are located at the midpoint of the cell in the x-direction and one quarter of the cell width from both the top and bottom of the cell in the z-direction. Two matrices are used to contain the velocity values. Starting at the second row and the second column, velocity values are calculated and inserted into the matrices. Velocity values of cells above the water table are assigned a value of zero. Dummy velocity values are assigned to the first and last columns and first row to control the movement of particles. To prevent the particles from leaving the region across a no-flow boundary, these values are equal to $-V_x$, V_z in the first and last columns and V_x, $-V_z$ in the first row, where

V_x is velocity in the x-direction and V_z is the velocity in the z-direction, thus, causing particles to be reflected back across the no-flow boundary and into the ground-water flow system. Along a discharge or recharge boundary, the velocity values are assumed to be equal to those in the adjacent cells, thereby allowing particles to leave the region.

3.1.7 *Subroutine DISPER*

Subroutine DISPER is the mass transport portion of the model. The subroutine is designed to move the contaminant particles through the ground-water system according to the deterministic-probabilistic modeling techniques discussed in the previous section.

Initially, particles are randomly placed along a horizontal line across the middle of the cell; the position of the particles defined by an x and z coordinate. Particles in the entire system are moved one at a time during any one time-step. First, components of the seepage velocity for each particle is interpolated from the velocity values at the four surrounding velocity values. The particle is moved with both a deterministic and random motion. The magnitude of the random motion is determined by the dispersivity, velocity, diffusion coefficient, time-step size and uniformly distributed random numbers.

The position of the particle is checked to determine whether or not it has encountered any boundary conditions (such as a no-flow boundary, movement beyond some confining layer or discharge to the surface). Depending upon the conditions involved, the particle may be relocated. Once the amount of mass associated with each particle has been adjusted to account for radioactive decay or cation exchange, concentration values are calculated for each cell. Concentration is determined by summing the total mass of contaminant in the cell and dividing by the volume of water in the cell, assuming a unit thickness. This sequence of operations is repeated for each particle in the system, after which new particles are added to the source cell at the start of the next simulation cycle.

It is sometimes necessary to limit the movement of particles in some parts of the cross-section. A specific example is a case where there are extreme contrasts in hydraulic conductivity within the region. In a unit with a relatively marked variability in velocity, an appropriate time-step size for the entire region might be too small to produce any contaminant movement in a low velocity zone. With a limitation on computer time available to carry out a simulation, contaminants might only move a few feet. Thus, it is only possible to simulate particle transport in the very low conductivity units with a large time-step. However, using a large time-step when the particles are outside of the confining zone could reduce accuracy or mislocate the particles. To overcome this problem, a feature has been added to the model which will cause particles to remain stationary once they enter specified portions of the entire region (usually the high velocity zones). A particle transport code is available to designate cells where the particles are allowed to move and cells where the particles are effectively removed from further transport within the model. The distribution of particles in either of these zones and the concentration of the particles in the zones of movement are determined and may be output to either the line printer or to a plotting file. Presently, the subroutine arrays are dimensioned to handle up to 8000 moving particles.

3.1.8 *Subroutine RANDU*

The movement of the reference particles is controlled by deterministic and probabilistic components of particle motion. One requirement for the calculation of the probabilistic motion is a uniformly distributed random number. This subroutine generates pseudo-random numbers in the range of 0 to 1 by the overflow of a single precision integer variable. It is machine dependent, suitable for use with computers that have a 32 bit word, for example the IBM and AMDAHL. Otherwise, it may be necessary to replace this subroutine.

3.1.9 *Subroutine ESCAPE*

This subroutine calculates the minimum time required for a particle to leave from the midpoint of a cell in either of

the coordinate directions. Its principal purpose is to aid in the construction of a controlling matrix to restrict the movement of particles to only some of the cells and to help in the choice of a time-step for transport simulations.

A matrix of escape time values is defined for cells in the region. Average velocity values in the coordinate directions for a cell are found by averaging the velocity values of the two elements in the cell. The time to leave the cell in both coordinate directions is found by dividing each of the half-cell dimensions by the appropriate velocity component and choosing the minimum time. A value of 10^{-35} is assigned to the cells above the water table. The antilog of the minimum time in either direction represents the escape time for that cell. These values can be written on printer output or on a disk. In practice, the time-step for the transport simulation is determined from these minimum escape times. As a guide, the smallest escape time in the region over which transport will probably occur is chosen, half of that value is then taken and adjusted slightly upwards or downwards to give a rounded value.

3.2 Input and Output Operations

3.2.1 *Input*

Data required as input to the model are discussed in this section. A user's guide containing a list of input parameters and variables and the input card setup is presented in Appendix 2. Appendix 4 contains an example input card deck.

Fourteen program control parameters (IC) are used in the program to control the nature of the simulation and the type of output required. If the user wishes to choose one of the particular functions, IC should be set to 1 (a value of 0 indicates that the routine or output is not required). The user has the option of running various routines, such as:

IC(1) : run the mass transport routine
IC(7) : calculate the velocity field

IC(9) : calculate the escape time values for a particle to leave a cell

The finite element grid and head distribution are automatically calculated. Several groups of calculations may be output to a line printer:

IC(2) : node coordinates
IC(3) : finite element incidences
IC(4) : hydraulic conductivity of the element
IC(5) : total head values
IC(8) : the velocity field
IC(10): the time-step guide
IC(12): particle and concentration distributions

Also, the following information may be written on a disk file:

IC(6) : head distribution
IC(11): time-step guide
IC(13): distribution of reference particles
IC(14): particle concentration distribution

The grid for the model is a regular array of nodes and elements. This grid is constructed within the program according to the user's input parameters. The user must specify the number of rows (NROW) and columns (NCOL) of nodes and the vertical (DELZ) and horizontal (DELX) spacing between nodes, in feet.

The cross-section may contain up to 10 different horizontal and vertical hydraulic conductivity units (NCOH, NCOV), porosity units (NPOR), longitudinal dispersivity units (NRET) and cation exchange capacity units (NCEC). The units are set up by assigning a numbered code, from 1 to 9 (ICOH, ICOV, IPOR, IRET, ICEC respectively), to each cell within that unit. The codes are ready in one row at a time starting with the first row, and having one code value assigned to each cell on that row. Each row starts a new card. The value of the parameter assigned to a unit (COH, COV, POR, RETI, CEC) is input with an accompanying unit number code identifier (IDGEO), which corresponds to the unit in the cross-section. This procedure is a very simple method for entering the data. As illustrated in the example in Appen-

dix 4, a simple graphical representation of the cross-section for the particular variable is formed. This style of data input facilitates rapid entry of data for complex settings, rapid alterations, and easy checking of input data.

Several hydrogeologic parameters are required to estimate the steady state head distribution. First, the location of the shape of the region along the upper boundary must be defined by identifying the row, for each column of nodes, that best approximates the position of the water table (IDWTR). Second, some of the top (i.e. water table), left, right or bottom boundary nodes may be assigned constant head values. A binary code sequence is used to indicate which nodes along these boundaries are assigned a constant head value and which have head values calculated within the program (ITBND, ILBND, IRBND and IBBND for the top, left, right and bottom boundaries respectively). A code value of 1 indicates that the node has a constant head value; this value is read on the following card, and 0 indicates that the head at that node will be calculated within the program. The code sequence is required for all nodes along these three boundaries, whether or not a constant head value is present. The constant head values (VALTCH, VALLCH, VALRCH, VALBCH) are read in sequentially (if required) starting at column 1 for the top and bottom boundaries and row 1 for the left and right boundaries. One advantage of being able to assign constant head values along all the boundaries is to allow the user the flexibility of simulating a smaller piece of a much larger cross-section in more detail.

Reference particles are introduced to the system at specified cells, defined by the cell's column (LCOL) and row (LROW) location. The number of particles that are added at each time-step (NPER) must be input by the user. For some simulations, as indicated previously, it may be necessary to limit particle motion within parts of the region. A binary code matrix (PTC) is used to indicate in which cells particles can be transported (PTC = 0) and in which cells they cannot (PTC = 1). Once a particle enters one of the latter cells, it is, in reality, assumed to be lost from the system. However, the location of the particle is known because the total number of particles in each of these types of cells is output.

3.2.2 *Output*

The simulation model will produce an echo of the basic input data and a variety of optional output. Appendix 5 shows some examples of the various output, which are discussed below.

The basic output consists of the problem title; the program control parameters; all geologic, hydrogeologic, and contaminant parameters and variables; a listing of the constant head nodes; the maps of the codes for the horizontal conductivity, vertical conductivity, cation exchange capacity, longitudinal dispersivity, porosity and particle transport code, as well as the actual values of these parameters assigned to each of the units; and a summary of the element grid parameters.

The optional output includes those values discussed in the previous section, selected by setting IC to 1. Output is normally directed to a line printer or to a disk storage file for later use. The plotting routines have not been included because the most important plotting routines are unique to our computer facility.

The output for the mass transport simulation represents a summary of the distribution and concentration of the particles at selected time-steps. User controlled parameters are available to control the size of the time-step (DELT), the total number of time-steps (NTIME) and the number of time-steps that pass before the results are printed (NSKIP).

4. SIMULATION EXAMPLES

In this section, two examples of simulations of contaminant migration from a buried source are presented. These examples were selected from the many trial simulations that have been analyzed to date and used to test the model. The results of other simulations are presented in CGS (1980). The primary purpose of these examples is to illustrate the preparation of a model grid for a cross-section, the setup of input data and the simulation results for a transport problem.

4.1 Example 1

The geological framework depicted here is typical of a layered sequence of sedimentary rock in which a repository may be located (Figure 4.1). The sequence consists of five hydrostatigraphic units with the lower two intersected by a vertical fault zone. The entire sequence is inclined at a slope of approximately 100 feet per 8400 feet. The water table, where it is defined in the upland area, is assumed to follow the trend of the ground surface. The hydraulic conductivity, porosity, longitudinal dispersivity and cation exchange capacity values assigned to the five units and the fault zone are presented in Table 4.1.

For convenience, the rectangular grid that is imposed over the cross-section is also inclined. In order to optimize the number of rows and columns, the cross-section is discretized to form a regular rectangular grid of 45 columns and 17 rows with a vertical node spacing of 150 feet and a horizontal node spacing of 6931 feet (Figure 4.1). With the inclined section, only the upper row of nodes (row 17) was necessary to define the shape of the upper boundary. Constant head values (representing a water table) were assigned to the nodes of columns 1 to 23 and column 45. The head is calculated at the other 21 nodes (Table 4.2), which in effect is a zone of no-flow. The other three boundaries are made no-flow boundaries by not assigning constant head nodes.

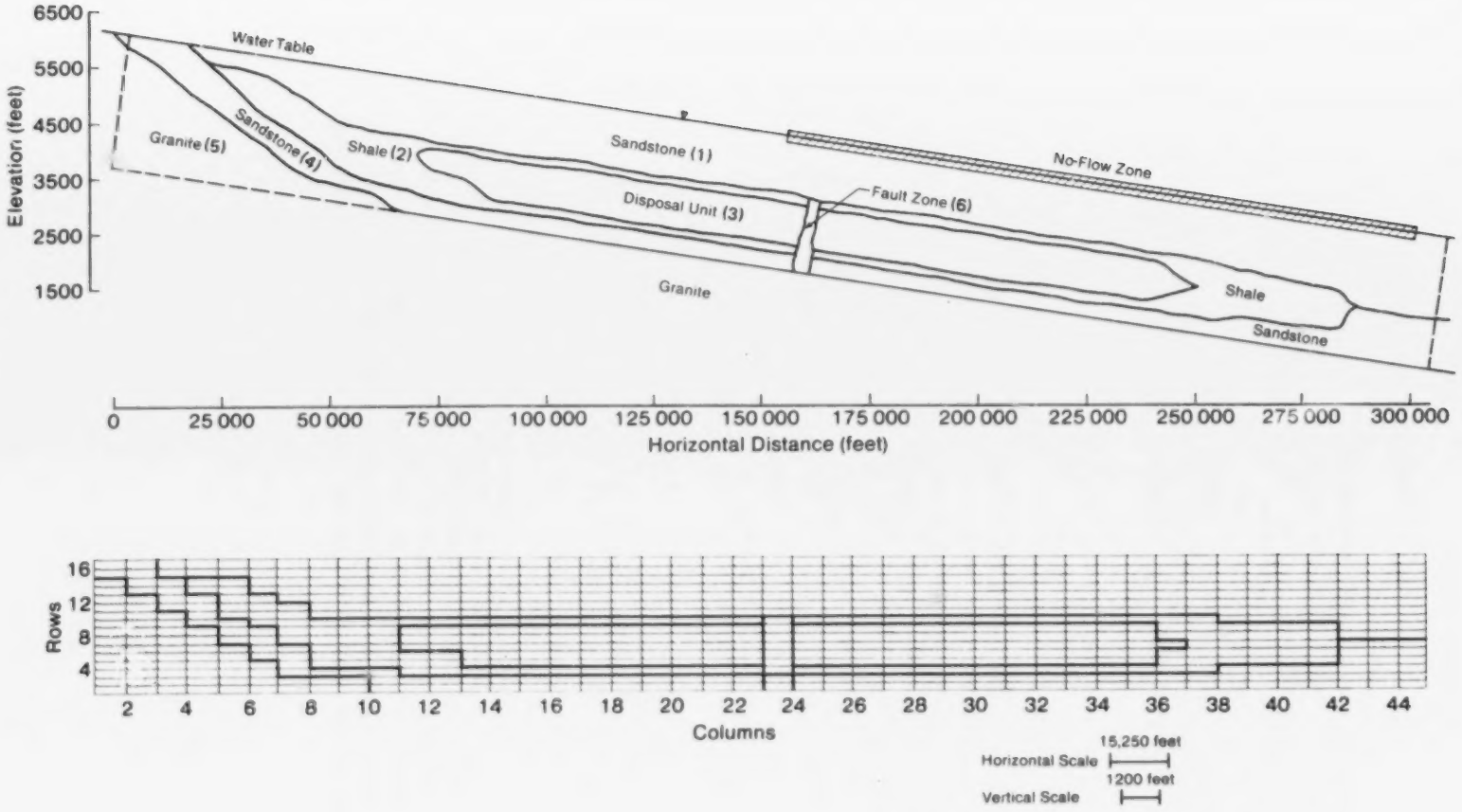


Figure 4.1 Cross-sections showing the geology and the model representation of Example 1.

Table 4.1 Geological Parameters, Example 1.

hydrostrat. unit	Kh[1]	Kv[1]	porosity	long disper.[2]	c.e.c.[3]
1	5.0×10^{1}	1.4×10^{0}	3.0×10^{-1}	5.0×10^{0}	1.0×10^{-1}
2	1.0×10^{-2}	1.0×10^{-3}	3.0×10^{-1}	5.0×10^{0}	1.0×10^{1}
3	1.0×10^{-5}	1.0×10^{-6}	3.0×10^{-2}	5.0×10^{0}	1.0×10^{-1}
4	4.0×10^{1}	7.0×10^{1}	3.0×10^{-1}	5.0×10^{0}	1.0×10^{-1}
5	5.0×10^{-6}	5.0×10^{-7}	3.0×10^{-2}	5.0×10^{0}	1.0×10^{-1}
6	4.0×10^{0}	7.0×10^{-1}	3.0×10^{-2}	5.0×10^{0}	1.0×10^{-1}

[1] hydraulic conductivity (ft/day)
[2] longitudinal dispersivity (ft)
[3] cation exchange capacity (meq/gm)

Table 4.2 Constant Head Values along the Water Table.

row	column	head	row	column	head	row	column	head
17	1	6100.	17	2	6075.	17	3	6050.
17	4	6025.	17	5	5925.	17	6	5750.
17	7	5600.	17	8	5525.	17	9	5500.
17	10	5475.	17	11	5415.	17	12	5355.
17	13	5295.	17	14	5235.	17	15	5175.
17	16	5115.	17	17	5055.	17	18	4995.
17	19	5935.	17	20	4875.	17	21	4815.
17	22	4715.	17	23	4615.	17	45	2500.

One cell, located at column 16 and row 6, was chosen to be the source of contaminants. The initial quantity of mass added to each of the moving particles is 500,000 mg. Parameters defining the properties of the contaminant and characteristics of the porous medium contaminant interactions are listed in Table 4.3.

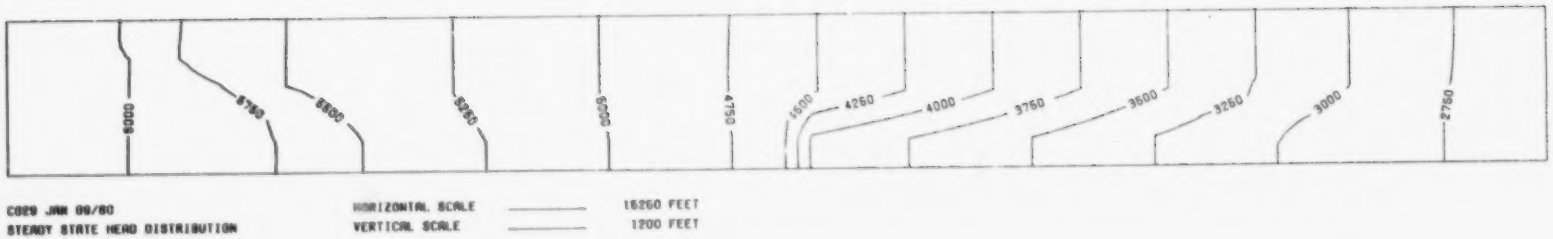
The contaminant is added to the system as a set of particles located randomly along the mid-line of the repository cell. For the case presented here, the movement of particles is simulated through 25 time-steps, with a size of 1.825×10^7 days. One hundred particles are added to the repository at the beginning of each time-step and moving particle and concentration distributions are written after every five time-steps.

Table 4.3 Contaminant Parameters, Example 1.

radioactive half-life	:	∞
bulk density of the medium	:	1.0
total concentration in solution	:	0.1
selectivity coefficient for exchange	:	0.0
initial mass added	:	500,000.0

Because much of the initial particle movement is in low conductivity units, a large time-step is utilized for the simulation. However problems will arise when particles enter the zones with much higher hydraulic conductivities. Thus, the movement of particles, as defined by the particle transport code, is only permitted in the disposal unit. Once particles have exited from this unit, it can be assumed that they have essentially reached the biosphere. The card deck for this case is contained in Appendix 4.

The resultant head distribution and particle distribution are presented on Figure 4.2. In addition, Appendix 5 contains the printed output for this example. While the model is capable of producing output for particle distributions for several time-steps, only one is included in this report. The results presented here are only for illustrative purposes. A more complete discussion of their significance can be found elsewhere (CGS, 1980).



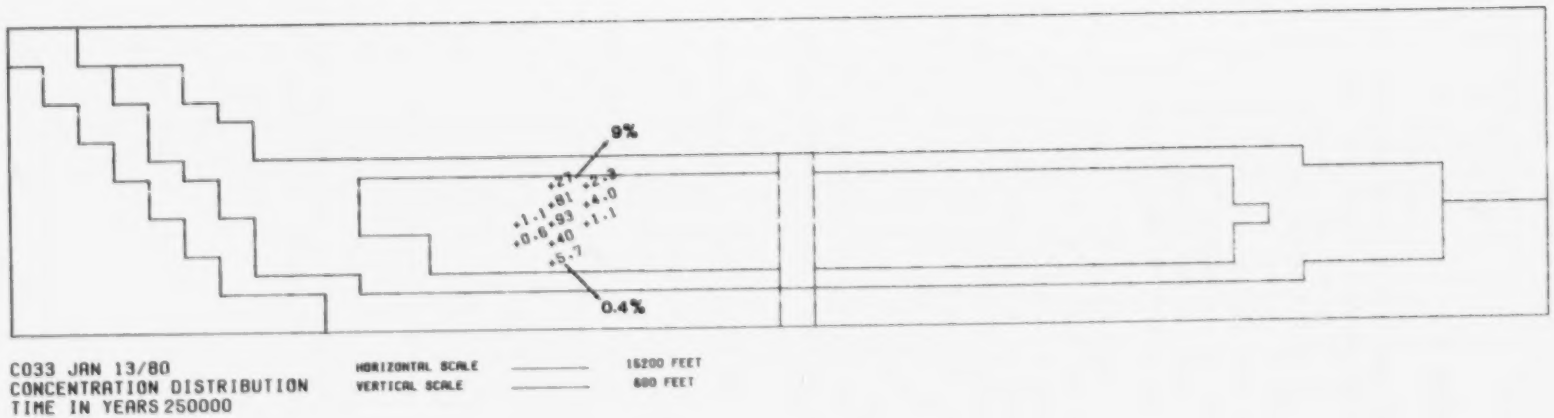


Figure 4.2 Cross-sections showing the distribution of hydraulic head and contaminant concentration, Example 1.

4.2 Example 2

The second geologic system that is used to illustrate the setup of the model grid and the input data is depicted in Figure 4.3. The cross-section represents a granite mass (pluton) underlying a layered sequence of siltstone and shale. The granite with a distributed fracture system is assumed to be the host rock for a waste repository. The rectangular grid that is used to discretize the cross-section is shown on Figure 4.3. The geologic parameters for the Example 2 are summarized on Table 4.4.

Again, the rectangular grid is comprised of 45 columns and 17 rows of nodes. However, the node spacing in the coordinate directions is now 500 feet and 150 feet. The sloping water table is represented, and this case, by decreasing the row position of the upper boundary of the flow system. Constant head values are assigned to all 45 nodes along the water table and no constant head values are assigned elsewhere (Table 4.5). Cells above the water table (i.e. outside of the flow region) have a value of zero assigned to the hydraulic conductivity, porosity, longitudinal dispersivity and cation exchange capacity.

Table 4.4 Geological Parameters, Example 2.

hydrostat. unit	Kh[1]	Kv[1]	porosity	long. disper.[2]	c.e.c.[3]
2	1.0×10^{-2}	1.0×10^{-2}	3.0×10^{-1}	5.0×10^{0}	1.0×10^{-1}
3	5.0×10^{-2}	5.0×10^{-2}	3.0×10^{-1}	5.0×10^{0}	1.0×10^{-1}
4	1.0×10^{-1}	1.0×10^{-1}	3.0×10^{-1}	5.0×10^{0}	1.0×10^{-1}
5	1.3×10^{-1}	1.3×10^{-1}	1.0×10^{-4}	5.0×10^{0}	1.0×10^{-1}

[1] hydraulic conductivity (ft/day)
[2] longitudinal dispersivity (ft)
[3] cation exchange capacity (meq/gm)

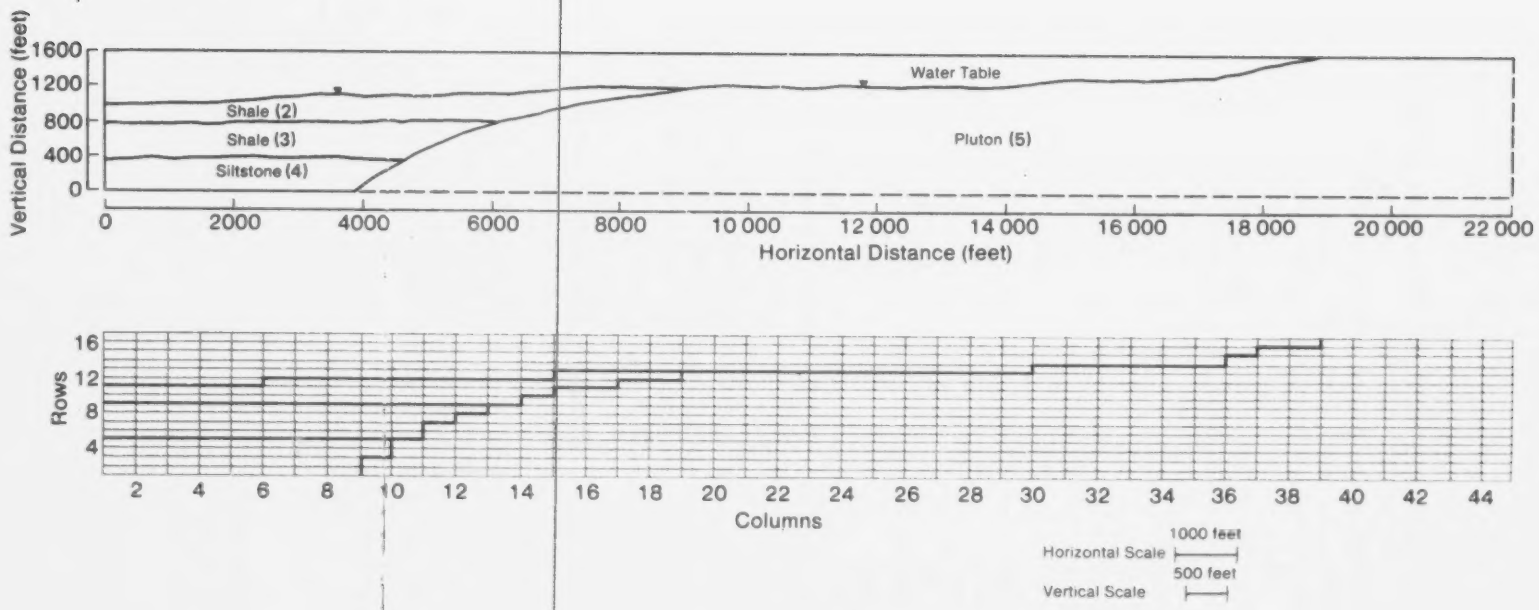


Figure 4.3 Cross-sections showing the geology and the model representation of Example 2.

Table 4.5 Constant Head Values along the Water Table.

row	column	head	row	column	head	row	column	head
11	1	3800.	11	2	3810.	11	3	3820.
11	4	3830.	11	5	3840.	12	6	3850.
12	7	3862.	12	8	3874.	12	9	3887.
12	10	3900.	12	11	3915.	12	12	3930.
12	13	3945.	12	14	3960.	13	15	3985.
13	16	3990.	13	17	3994.	13	18	3995.
13	19	3996.	13	20	3997.	13	21	3998.
13	22	3999.	13	23	4000.	13	24	4001.
13	25	4002.	13	26	4003.	13	27	4010.
13	28	4025.	13	29	4040.	14	30	4055.
14	31	4070.	14	32	4095.	14	33	4110.
14	34	4125.	14	35	4140.	15	36	4070.
16	37	4240.	16	38	4295.	17	39	4350.
17	40	4360.	17	41	4390.	17	42	4403.
17	43	4410.	17	44	4415.	17	45	4420.

The waste depository is located in the cell located at column 35 and row 3. The parameters defining the properties of the contaminant and the character of the chemical interactions are listed on Table 4.6.

Table 4.6 Contaminant Parameters, Example 2.

radioactive half-life	:	∞
bulk density of the medium	:	1.0
total concentration in solution	:	0.1
selectivity coefficient for exchange	:	0.0
initial mass added	:	141.0

In this case, the simulation moves through 25 time-steps with 100 reference particles added to the depository at the beginning of each time-step. The size of the time-step is

1.50 days. Results are listed every 5 time-steps. The reference particles are allowed to move only in the granitic host rock, as indicated by the particle transport code.

The input card deck for this case is contained in Appendix 4. The resultant head distribution and particle distribution is illustrated on Figure 4.4. The printed output is not provided for this example. Further discussion of the results of this example can be found in CGS (1980).

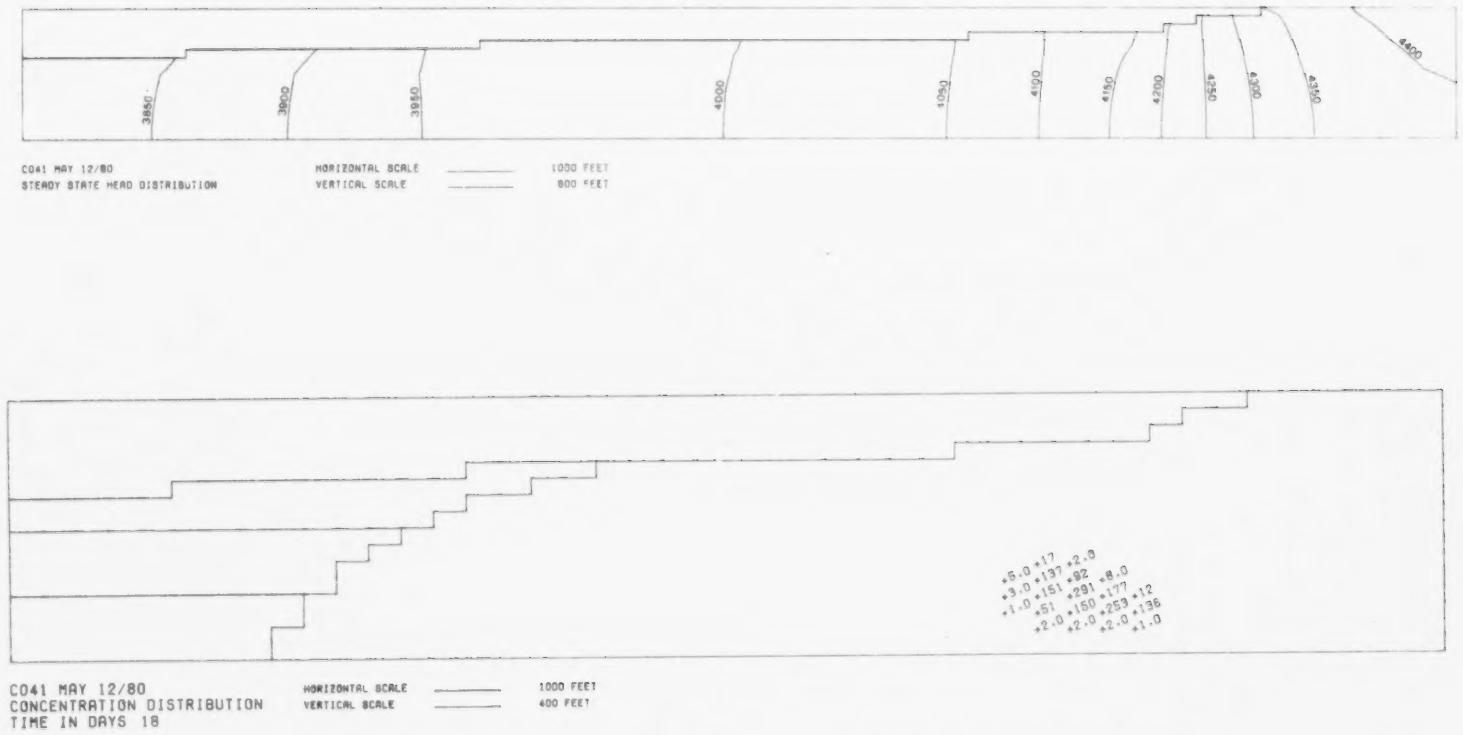


Figure 4.4 Cross-sections showing the distribution of hydraulic head and contaminant concentration, Example 2.

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APPENDIX 1:

DEFINITIONS

DEFINITIONS

A number of terms are used extensively throughout this manual and the computer program. To clarify their meaning, a brief definition of these terms is presented below:

parameter: a value that remains constant during the simulation (defined or read only once, at the beginning of the simulation).

variable: a value that changes during the course of the simulation (these values are typically read or determined within the program at each time-step).

row : a string of nodes, elements, cells, etc., on the same horizontal level (see Figure A-1).

column : a string of nodes, cells, elements, etc., on the same vertical level (see Figure A-1).

x - direction: analogous to horizontal direction.

z - direction: analogous to vertical direction.

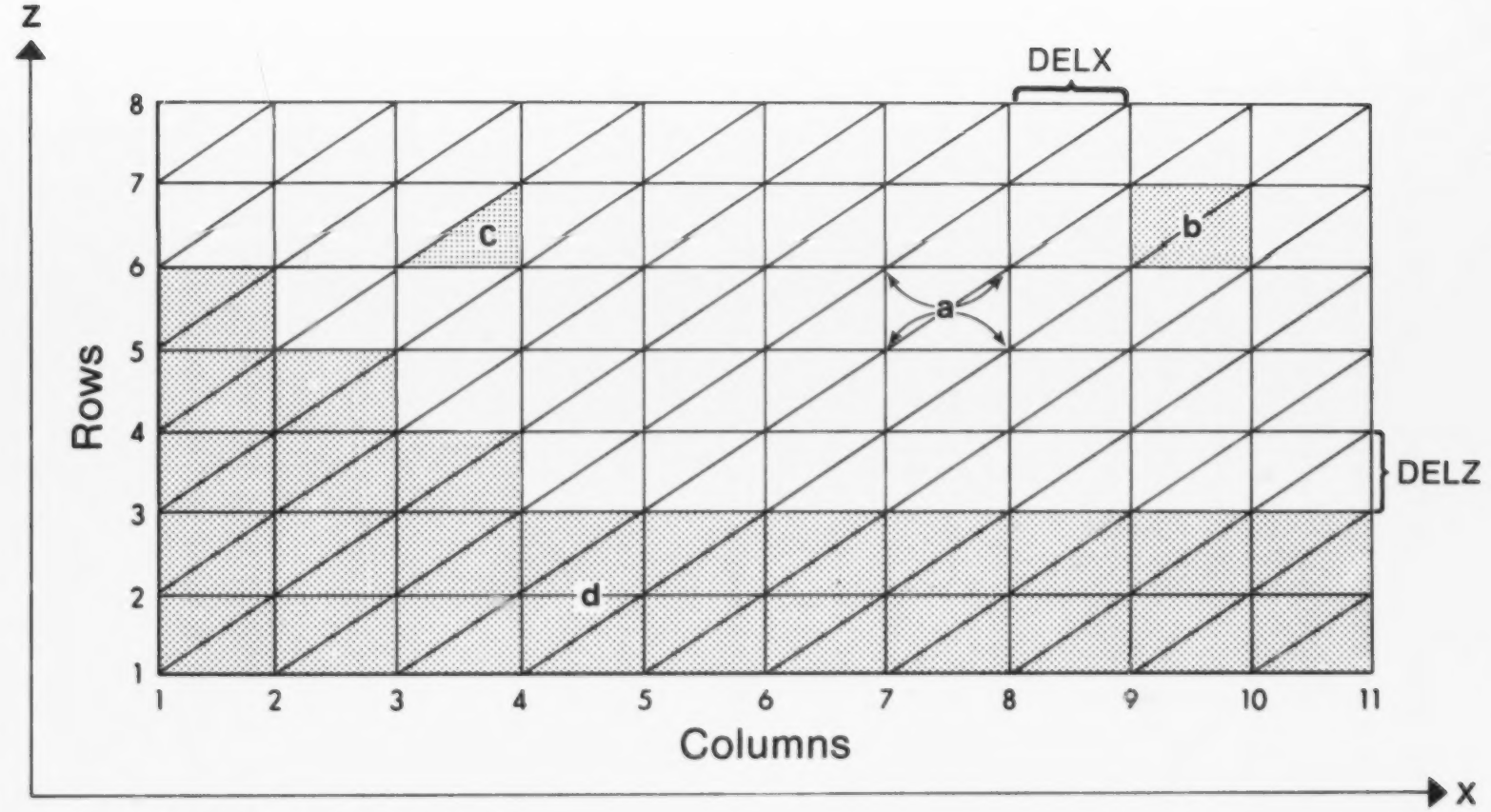
cell: a block of the cross-section bounded by four corner nodes (see Figure A-1).

node: a point at the intersection of the grid lines in the cross-section, defined by a row or column number, x or z co-ordinate (see Figure A-1).

element: a triangular portion of a cell, used by the finite element method to calculate the head distribution (see Figure A-1).

unit: a group of cells that have a common geological or hydrogeological property, similar to an actual stratigraphic unit (see Figure A-1).

The English system of units of measurements is generally used in the computer code. All parameters and variables, except those relating to concentrations and bulk density, must be in units of feet and days.



Legend : **a** – Node
b – Cell
c – Element
d – Unit

APPENDIX 2:

USER'S GUIDE

Dimensioning of the Arrays

There are several subscripted variables used in the program which must be properly dimensioned. Changes are only required in the main program because execution time dimensioning of arrays is utilized by the subroutines. The following information provides a basis for dimensioning individual arrays for a given problem:

```
INTEGER*2 ILBND(nrow),ITBND(ncol),IRBND(nrow),IBBND(ncol),
          ICOH(ncol,nrow),ICOV(ncol,nrow),IPOR(ncol,nrow),
          ICEC(ncol,nrow),PTC(ncol,nrow),IRET(ncol,nrow),
          IDWTR(ncol),LROW(nrcell),LCOL(nrcell),ICCC(ncol),
          ICCR(ncol),IN(nelme,3),TYPE(nnodee),LC(nnodee)

INTEGER NPER(nrcell,ntime),IC(15)

REAL  TITLE(20),RET(10),POR(10),CEC(10),COH(10),COV(10),
      VALRCH(nrow),VALTCH(ncol),VALLCH(nrow),VALBCH(ncol),
      X(nnodee),Z(nnodee),ANGLE(nelme),PHI(nnodee),
      CONR(ncol,nrow),COT(ncol,nrow),AT(ncol,nrow),
      COUNT(ncol,nrow),CONP(ncol,nrow),EXT(ncol,nrow)

REAL*8 DELZ,DELX,CX(nelme),CZ(nelme),CHEAD(nchead),
      F(nnodee),S(nnodee,nb),SC(nnodee,nchead),HEAD(nnodee),
      VX(nhelm,nvelm),VZ(nhelm,nvelm)
```

where:
- ncol = number of columns of nodes
- nrow = number of rows of nodes
- nnodee= estimated number of nodes; (ncol*nrow)
- nchead= total number of constant head nodes
- nelme = estimated number of finite elements; (2 * (nrow-1) * (ncol-1))
- nrcell= number of cells which initally receive particles
- ntime = number of steps in time
- nb = estimated bandwidth of the finite element coefficient matrix; (nrow+2)
- nhelm = number of horizontal rows of finite elements; (ncol + 1)
- nvelm = number of vertical rows of finite elements; (nrow * 2) - 1

Input Variables

This section provides the user with a list of the input variables and their definitions.

problem identifier:

TITLE : any title up to 80 characters

program control parameters:

IC(1) : run the mass transport routine
IC(2) : print the node co-ordinates
IC(3) : print the finite element incidences
IC(4) : print the element hydraulic conductivities
IC(5) : print the total head values
IC(6) : output the total head values to a plotting file
IC(7) : calculate the velocity field
IC(8) : print the velocity field values
IC(9) : run the time-step guide routine
IC(10) : print the time-step guide values
IC(11) : output the time-step guide values to a plotting file
IC(12) : print the particle and concentration distribution
IC(13) : output the particle distribution to a plotting file
IC(14) : output the concentration distribution to a plotting file

hydraulic parameters

IDWTR : row number (of each column of nodes) that defines the position of the water table
ITBND : code which indicates which water table nodes are assigned constant head values
VALTCH : constant head values assigned to the water table nodes, in feet
ILBND : code which indicates which left boundary nodes are assigned constant head values
VALLCH : constant head values assigned to the left boundary nodes, in feet
IRBND : code which indicates which right boundary nodes are assigned constant head values
VALRCH : constant head values assigned to the right boundary nodes, in feet
IBBND : code which idicates which bottom boundary nodes are assigned constant head values
VALBCH : constant head values assigned to the bottom boundary nodes, in feet

cross-section parameters

NROW : number of rows of nodes
NCOL : number of columns of nodes
DELX : horizontal node spacing, in feet
DELZ : vertical node spacing, in feet
NCOH : number of horizontal hydraulic conductivity units
NCOV : number of vertical hydraulic conductivity units
NRET : number of longitudinal dispersivity units
NPOR : number of porosity units
NCEC : number of cation exchange capacity units
IDGEO : geological unit identifier
COH : horizontal hydraulic conductivity assigned to a geological unit, in feet/day
COV : vertical hydraulic conductivity assigned to a geological unit, in feet/day
ICOH : horizontal hydraulic conductivity unit identifier
ICOV : vertical hydraulic conductivity unit identifier
RET : longitudinal dispersivity assigned to a geological unit, in feet
IRET : longitudinal dispersivity unit identifier
CEC : cation exchange capacity assigned to a geological unit, in meq/gm
ICEC : cation exchange capacity unit identifier
POR : porosity value assigned to a geologic unit
IPOR : porosity unit identifier

contaminant parameters and variables

SOLUTE : total concentration of the contaminant in solution
SELC : selectivity coefficient for exchange
BULK : bulk density of the geologic media
RADHAF : radioactive half-life of the contaminant, in days (negative value if there is no radioactive decay)
ASSI : initial mass added to a cell, in mg
NRCELL : number of cells which initially receive contaminants
PTC : particle transport code which designates the cells where particles are allowed to move
LROW : row number of the cell which initially receives the contaminant
LCOL : column number of the cell which initially receives the contaminant
NPER : number of contaminant particles added per time-step

time-step parameters

DELT : size of the time-step, in days
NSKIP : number of time-steps that pass before the results are output
NTIME : total number of time-steps

Input Card Instructions

The variables and parameters input into the program must conform to the order, format, and columns of the following cards:

CARD	VARIABLE	FORMAT	COLUMNS
1	TITLE	20A4	1 - 80
2	IC	14I5	1 - 5, 6 - 10, ...
3	NROW	I5	1 - 5
	NCOL	I5	6 - 10
	NWT	I5	11 - 15
	NRCELL	I5	16 - 20
	NTIME	I5	21 - 25
	NSKIP	I5	26 - 30
4	DELX	F10.0	1 - 10
	DELZ	F10.0	11 - 20
	DELT	F10.0	21 - 30
5	NCOH	I5	1 - 5
	NCOV	I5	6 - 10
	NRET	I5	11 - 15
	NPOR	I5	16 - 20
	NCEC	I5	21 - 25
6	SOLUTE	F10.0	1 - 10
	SELC	F10.0	11 - 20
	BULK	F10.0	21 - 30
	RADHAF	F10.0	31 - 40
	ASSI	F10.0	41 - 50
7[1]	LCOL	I5	1 - 5
	LROW	I5	6 - 10
	NPER	14I5	1 - 5, 6 - 10, ...
		16I5	1 - 5, 6 - 10, ...
8[2]	IDWTR	25I3	1 - 3, 4 - 6, ...
9[2]	ITBND	80I1	1, 2, 3, 4, ...
10[2]	VALTCH	8F10.0	1 - 10, 11 - 20, ...
11[2]	ILBND	80I1	1, 2, 3, 4, ...
12[5]	VALLCH	8F10.0	1 - 10, 11 - 20, ...
13[2]	IRBND	80I1	1, 2, 3, 4, ...

14[5]	VALRCH	8F10.0	1 - 10, 11 - 20, ...
15[2]	IBBND	80I1	1, 2, 3, 4, ...
16[5]	VALBCH	8F10.0	1 - 10, 11 - 20, ...
17[3]	IDGEO	I5	1 - 5
	COH	E10.4	6 - 15
18[4]	ICOH	80I1	1, 2, 3, 4, ...
19[3]	IDGEO	I5	1 - 5
	COV	E10.4	6 - 15
20[4]	ICOV	80I1	1, 2, 3, 4, ...
21[3]	IDGEO	I5	1 - 5
	RET	E10.4	6 - 15
22[4]	IRET	80I1	1, 2, 3, 4, ...
23[3]	IDGEO	I5	1 - 5
	POR	E10.4	6 - 15
24[4]	IPOR	80I1	1, 2, 3, 4, ...
25[3]	IDGEO	I5	1 - 5
	CEC	E10.4	6 - 15
26[4]	ICEC	80I1	1, 2, 3, 4, ...
27[4]	PTC	80I1	1, 2, 3, 4, ...

notes: [1] - continue NPER on the following cards under 16I5 format, if necessary.
[2] - continue on the following cards, under the same format, if necessary.
[3] - each of the units should be put on a seperate card.
[4] - continue on the following cards if the number of columns is greater than 80 and one line for each row.
[5] - not necessary if no constant head values; continue on the following cards if there are more than eight values.

APPENDIX 3:

COMPUTER PROGRAM LISTING

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C*******************************************************************************
C
C   A DETERMINISTIC PROBABILISTIC MODEL FOR CONTAMINANT TRANSPORT
C   IN A TWO-DIMENSIONAL CROSS-SECTION UTILIZING LINEAR TRIANGULAR
C   FINITE ELEMENTS
C
C  PROGRAMMED APRIL, 1980
C
C
C*******************************************************************************
C
C              PROGRAM VARIABLES AND PARAMETERS
C
C  ANGLE : ANGLE OF INCLINATION OF THE HYDRAULIC CONDUCTIVITY FROM
C          THE HORIZONTAL PLANE
C  ASSI  : INITIAL MASS OF THE PARTICLES
C  BULK  : BULK DENSITY OF THE GEOLOGIC MEDIUM
C  CEC   : CATION EXCHANGE CAPACITY ASSIGNED TO EACH GEOLOGIC UNIT
C  CHEAD : VECTOR CONTAINING ALL CONSTANT HEAD VALUES
C  COH   : HORIZONTAL HYDRAULIC CONDUCTIVITY ASSIGNED TO A GEOLOGIC UNIT
C  COV   : VERTICAL HYDRAULIC CONDUCTIVITY ASSIGNED TO A GEOLOGIC UNIT
C  CX    : HORIZONTAL HYDRAULIC CONDUCTIVITY OF AN ELEMENT
C  CZ    : VERTICAL HYDRAULIC CONDUCTIVITY OF AN ELEMENT
C  DELT  : SIZE OF THE TIME-STEP, IN DAYS
C  DELX  : HORIZONTAL NODE SPACING, IN FEET
C  DELZ  : VERTICAL NODE SPACING, IN FEET
C  EXT   : MINIMUM TIME REQUIRED FOR A PARTICLE TO LEAVE A CELL UNDER THE
C          INFLUENCE OF GROUNDWATER FLOW ONLY
C  HEAD  : HYDRAULIC HEAD VALUES
C  IC(1) : OPTION TO RUN THE MASS TRANSPORT PROBLEM
C  IC(2) : OPTION TO PRINT NODE CO-ORDINATES
C  IC(3) : OPTION TO PRINT ELEMENT INCIDENCES
C  IC(4) : OPTION TO PRINT ELEMENT PERMEABILITY
C  IC(5) : OPTION TO PRINT TOTAL HEAD VALUES
C  IC(6) : OPTION TO OUTPUT HEAD VALUES FOR PLOTTING
C  IC(7) : OPTION TO CALCULATE THE VELOCITY FIELD
C  IC(8) : OPTION TO PRINT THE VELOCITY FIELD
C  IC(9) : OPTION TO RUN THE TIME-STEP GUIDE
C  IC(10): OPTION TO PRINT THE TIME-STEP GUIDE FIELD
C  IC(11): OPTION TO OUTPUT THE TIME-STEP GUIDE FIELD FOR PLOTTING
C  IC(12): OPTION TO PRINT PARTICLE AND CONCENTRATION DISTRIBUTIONS
C  IC(13): OPTION TO OUTPUT THE DISTRIBUTION OF REFERENCE PARTICLES
C          FOR PLOTTING
C  IC(14): OPTION TO OUTPUT THE CONCENTRATION DISTRIBUTION FOR PLOTTING
C  ICEC  : CATION EXCHANGE CAPACITY CODE IDENTIFYING CELLS IN EACH UNIT
C  ICOH  : HORIZONTAL HYDRAULIC CONDUCTIVITY CODE IDENTIFYING CELLS IN
C        : EACH UNIT
C  ICOV  : VERTICAL HYDRAULIC CONDUCTIVITY CODE IDENTIFYING CELLS IN
C        : EACH UNIT
C  IDWTR : ROW NUMBER (OF EACH COLUMN OF NODES) THAT DEFINES THE
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C            POSITION OF THE WATER TABLE
C  IN      : FINITE ELEMENT INCIDENCES
C  IPOR    : POROSITY CODE IDENTIFYING CELLS IN EACH UNIT
C  IRBND   : CODE WHICH IDENTIFIES WHICH RIGHT BOUNDARY NODES ARE CONSTANT HEAD
C  IRET    : LONGITUDINAL DISPERSIVITY CODE IDENTIFYING CELLS IN EACH UNIT
C  IBBND   : CODE WHICH IDENTIFIES WHICH BOTTOM BOUNDARY NODES ARE CONSTANT HEAD
C  ITBND   : CODE WHICH IDENTIFIES WHICH WATER TABLE NODES ARE CONSTANT HEAD
C  ILBND   : CODE WHICH IDENTIFIES WHICH LEFT BOUNDARY NODES ARE CONSTANT HEAD
C  IDGEO   : GEOLOGIC UNIT IDENTIFIER
C  LCOL    : COLUMN IDENTIFIER FOR CELLS WHICH INITIALLY RECEIVE THE CONTAMINANT
C  LCR     : UNIT NUMBER ASSIGNED TO THE CARD READER
C  LLP     : UNIT NUMBER ASSIGNED TO THE LINE PRINTER
C  LPCD    : UNIT NUMBER ASSIGNED TO THE DEVICE INTO WHICH THE CONCENTRATION
C            DISTRIBUTION OF PARTICLES ARE STORED FOR PLOTTING
C  LPDH    : UNIT NUMBER ASSIGNED TO THE DEVICE INTO WHICH THE DISTRIBUTION
C            OF PARTICLES ARE STORED FOR PLOTTING
C  LPH     : UNIT NUMBER ASSIGNED TO THE DEVICE INTO WHICH THE HEAD VALUES
C            ARE STORED FOR PLOTTING
C  LPTS    : UNIT NUMBER ASSIGNED TO THE DEVICE INTO WHICH THE TIME-STEP
C            VALUES ARE STORED FOR PLOTTING
C  LROW    : ROW IDENTIFIER FOR CELLS WHICH INITIALLY RECEIVE THE CONTAMINANT
C  NB      : ESTIMATED BANDWIDTH
C  NCHEAD  : NUMBER OF CONSTANT HEAD NODES
C  NCOL    : NUMBER OF COLUMNS OF NODES
C  NCEC    : NUMBER OF CATION EXCHANGE CAPACITY UNITS
C  NCOH    : NUMBER OF HORIZONTAL HYDRAULIC CONDUCTIVITY UNITS
C  NCOV    : NUMBER OF VERTICAL HYDRAULIC CONDUCTIVITY UNITS
C  NELME   : ESTIMATED NUMBER OF ELEMENTS IN THE FINITE ELEMENT GRID
C  NELM    : ACTUAL NUMBER OF ELEMENTS IN THE FINITE ELEMENT GRID
C  NHCELL  : NUMBER OF CELLS IN THE HORIZONTAL DIRECTION
C  NHELM   : NUMBER OF ELEMENTS IN THE HORIZONTAL DIRECTION
C  NNODE   : ACTUAL NUMBER OF NODES IN THE FINITE ELEMENT GRID
C  NNODEE  : ESTIMATED NUMBER OF NODES IN THE FINITE ELEMENT GRID
C  NPER    : NUMBER OF CONTAMINANT PARTICLES ADDED DURING EACH TIME-STEP
C  NPOR    : NUMBER OF POROSITY UNITS
C  NROW    : NUMBER OF ROWS OF NODES
C  NRCELL  : NUMBER OF CELLS WHICH INITIALLY RECEIVE CONTAMINANTS
C  NRET    : NUMBER OF LONGITUDINAL DISPERSIVITY UNITS
C  NTIME   : TOTAL NUMBER OF TIME-STEPS
C  NSKIP   : NUMBER OF TIME-STEPS THAT PASS BEFORE RESULTS ARE PRINTED
C  NVCELL  : NUMBER OF CELLS IN THE VERTICAL DIRECTION
C  NVELM   : NUMBER OF ELEMENTS IN THE VERTICAL DIRECTION
C  POR     : POROSITY VALUE ASSIGNED TO A GEOLOGIC UNIT
C  PTC     : PARTICLE TRANSPORT CODE WHICH IDENTIFIES CELLS WHERE PARTICLES
C            ARE ALLOWED TO MOVE (0 = MOVEMENT; 1 = NO MOVEMENT)
C  RADHAF  : RADIOACTIVE HALF-LIFE OF THE CONTAMINANT (-VE VALUE IF NO DECAY)
C  RET     : LONGITUDINAL DISPERSIVITY ASSIGNED TO A GEOLOGIC UNIT
C  SELC    : SELECTIVITY COEFFICIENT FOR EXCHANGE
C  SOLUTE  : TOTAL CONCENTRATION OF THE CONTAMINANT IN SOLUTION
C  TITLE   : PROBLEM IDENTIFIER (ANY TITLE WITH UP TO 80 CHARACTERS)
C  TYPE    : NODE TYPE IDENTIFIER (1=CONSTANT HEAD; 0=VARIABLE HEAD)
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```
C  VALTCH: CONSTANT HEAD VALUES ASSIGNED TO THE WATER TABLE NODES
C  VALLCH: CONSTANT HEAD VALUES ASSIGNED TO THE LEFT BOUNDARY NODES
C  VALBCH: CONSTANT HEAD VALUES ASSIGNED TO THE BOTTOM BOUNDARY NODES
C  VALRCH: CONSTANT HEAD VALUES ASSIGNED TO THE RIGHT BOUNDARY NODES
C  VX     : GROUNDWATER VELOCITY IN THE HORIZONTAL DIRECTION
C  VZ     : GROUNDWATER VELOCITY IN THE VERTICAL DIRECTION
C  X      : X CO-ORDINATE OF A NODE
C  Z      : Z CO-ORDINATE OF A NODE
C
C*******************************************************************************
C
      INTEGER*2 ILBND(17),ITBND(45),IRBND(17),IBBND(45),ICOH(45,17),
     1        ICOV(45,17),IPOR(45,17),ICEC(45,17),PTC(45,17),IRET(45,17),
     2        IDWTR(45),LROW(1),LCOL(1),ICCC(45),ICCR(45),IN(1408,3),
     3        TYPE(765),LC(765)
      INTEGER NPER(1,25),IC(15)
      REAL    TITLE(20),RET(10),POR(10),CEC(10),COH(10),COV(10),
     1        VALRCH(17),VALTCH(45),VALLCH(17),VALBCH(45),ANGLE(1408),
     2        PHI(765),CONR(45,17),COT(45,17),AT(45,17),COUNT(45,17),
     3        CONP(45,17),EXT(45,17),X(765),Z(765)
      REAL*8 DELZ,DELX,CX(1408),CZ(1408),CHEAD(45),HEAD(765),F(765),
     1        S(765,19),SC(765,45),VX(46,33),VZ(46,33)
      COMMON DELX,DELZ,LLP,NROW,NCOL,NNODE,NELM,NHELM,NVELM,NHCELL,
     1        NVCELL,NNODEE,NELME,NB
C
C  INPUT AND OUTPUT UNIT DEVICE NUMBERS
      LCR=5
      LLP=6
      LPH=10
      LPTS=13
      LPDP=11
      LPCD=12
C
C  PROBLEM TITLE
      WRITE(LLP,2)
    2 FORMAT(1H1)
      READ (5,101) TITLE
  101 FORMAT (20A4)
      WRITE(LLP,1)
    1 FORMAT(//1X,130('*')//)
      WRITE (LLP,102) TITLE
  102 FORMAT(1X,20A4)
      WRITE(LLP,1)
C
C  READ AND WRITE OUTPUT OPTION CODES
      READ(LCR,103)(IC(I),I=1,14)
  103 FORMAT(16I5)
      WRITE(LLP,104)
  104 FORMAT(//1X,'OUTPUT LISTINGS AND PROBLEM CONTROL;  1 = YES, ',
     1      '0 = NO')
      WRITE(LLP,108)(IC(I),I=1,8)
```

```
  108 FORMAT(/I6,': RUN THE MASS TRANSPORT ROUTINE'/I6,': PRINT THE ',
     1      'NODE CO-ORDINATES'/I6,': PRINT THE ELEMENT INCIDENCES'/I6,
     2      ': PRINT THE ELEMENT HYDRAULIC CONDUCTIVITIES'/I6,
     3      ': PRINT THE TOTAL HEAD VALUES'/I6,': OUTPUT THE HEAD ',
     4      'VALUES TO A PLOTTING FILE'/I6,': CALCULATE THE VELOCITY ',
     5      'FIELD'/I6,': PRINT THE VELOCITY FIELD')
       WRITE(LLP,109)(IC(I),I=9,14)
  109 FORMAT(1X,I5,': RUN THE TIME-STEP GUIDE ROUTINE'/I6,': PRINT THE',
     1      ' TIME-STEP GUIDE'/I6,': OUTPUT THE TIME-STEP GUIDE TO A ',
     2      'PLOTTING FILE'/I6,': PRINT THE PARTICLE AND CONCENTRATION ',
     3      'DISTRIBUTION'/I6,': OUTPUT THE PARTICLE DISTRIBUTION TO A ',
     4      'PLOTTING FILE'/I6,': OUTPUT THE CONCENTRATION DISTRIBUTION',
     5      ' TO A PLOTTING FILE'///)
C
C  READ CROSS-SECTION GRID AND CONTAMINANT PARAMETERS
       READ(LCR,103)NROW,NCOL,NRCELL,NTIME,NSKIP
       READ(LCR,113)DELX,DELZ,DELT
       READ(LCR,103)NCOH,NCOV,NRET,NPOR,NCEC
       READ(LCR,113)SOLUTE,SELC,BULK,RADHAF,ASSI
  113 FORMAT(8F10.0)
       DO 10 I=1,NRCELL
   10 READ(LCR,103)LCOL(I),LROW(I),(NPER(I,J),J=1,NTIME)
C
C  OUTPUT FINITE ELEMENT GRID AND CONTAMINANT PARAMETERS
       WRITE(LLP,114)NROW,NCOH,NCOL,NCOV,DELX,NRET,DELZ,NPOR,NCEC
  114 FORMAT(1X,'CROSS-SECTION SUMMARY'//6X,'NUMBER OF ROWS:',I14,10X,
     1      'NUMBER OF HORZ. CONDUCTIVITY UNITS:',I5/6X,'NUMBER OF ',
     2      'COLUMNS:',I11,10X,'NUMBER OF VERT. CONDUCTIVITY UNITS:',
     2      I5/6X,'HORZ. NODE SPACING:',F10.1,10X,'NUMBER OF LONG. ',
     4      'DISPERSIVITY UNITS:',I5/6X,'VERT. NODE SPACING:',F10.1,
     5      10X,'NUMBER OF DIFFERENT POROSITY UNITS:',I5/45X,'NUMBER ',
     6      'OF DIFFERENT C.E.C. UNITS:',I7)
C
C  OUTPUT CONTAMINANT PARAMETERS
       WRITE(LLP,115)RADHAF,NSKIP,NTIME,SOLUTE,BULK,SELC,DELT,ASSI
  115 FORMAT(///1X,'CONTAMINANT PARAMETERS'/
     1      6X,'RADIOACTIVE HALF-LIFE:',F10.2,10X,'NUMBER OF STEPS ',
     2      'BETWEEN LISTINGS:',I11/6X,'NUMBER OF STEPS IN TIME:',I6,
     3      10X,'TOTAL CONCENTRATION IN SOLUTION:',F12.4/6X,'BULK ',
     4      'DENSITY OF MEDIUM:',F9.2,10X,'SELECTIVITY COEFFICIENT',
     5      ' FOR EXCHANGE:',F7.2/6X,'SIZE OF TIME-STEP:',F14.2,
     6      10X,'INITIAL MASS ADDED PER PART:',F16.3//)
C
C  OUTPUT PARTICLES ADDED TO SYSTEM PER TIME-STEP
       WRITE(LLP,117)
  117 FORMAT(/' NUMBER OF PARTICLES ADDED TO THE SYSTEM PER TIME-STEP'
     1      //'          ROW  COLUMN        PARTICLES ADDED PER STEP')
       DO 20 I=1,NRCELL
       K=15
       IF(NTIME.LT.15)K=NTIME
       WRITE(LLP,118)LROW(I),LCOL(I),(NPER(I,J),J=1,K)
```

```
      118 FORMAT(6X,I5,I7,I10,14I7)
          IF(NTIME.GT.15)WRITE(LLP,119)(NPER(I,J),J=16,NTIME)
      119 FORMAT(6X,I22,14I7)
       20 CONTINUE
C
C  READ AND WRITE INITIAL WATER TABLE HEAD VALUES
          NCHEAD=0
          READ(LCR,121)(IDWTR(I),I=1,NCOL)
      121 FORMAT(25I3)
          READ(LCR,122)(ITBND(I),I=1,NCOL)
      122 FORMAT(80I1)
          J=0
          DO 30 I=1,NCOL
          IF(ITBND(I).EQ.0)GO TO 30
          J=J+1
          ICCC(J)=I
          ICCR(J)=IDWTR(I)
       30 CONTINUE
          READ(LCR,113)(VALTCH(I),I=1,J)
          WRITE(LLP,2)
          WRITE(LLP,123)
      123 FORMAT(1H1///1X,'ROW AND COLUMN NUMBERS AND HEAD VALUES OF
     1        'CONSTANT HEAD NODES'///1X,'WATER TABLE',/)
          WRITE(LLP,120)
      120 FORMAT(1X,5('COLUMN  ROW    HEAD        ')/)
          WRITE(LLP,124)(ICCC(I),ICCR(I),VALTCH(I),I=1,J)
      124 FORMAT(1X,I6,I5,F10.2,I11,I5,F10.2,I11,I5,F10.2,I11,I5,F10.2,
     1       I11,I5,F10.2)
          NCHEAD=NCHEAD+J
C
C  READ AND WRITE INITIAL LEFT BOUNDARY HEAD VALUES
          J=0
          K=IDWTR(1)
          READ(LCR,122)(ILBND(I),I=1,K)
          DO 40 I=1,K
          IF(ILBND(I).EQ.0)GO TO 40
          J=J+1
          ICCC(J)=I
       40 CONTINUE
          IF(J.EQ.0)GO TO 45
          READ(LCR,113)(VALLCH(I),I=1,J)
          WRITE(LLP,126)
      126 FORMAT(/1X,'LEFT BOUNDARY'/)
          WRITE(LLP,120)
          K=1
          WRITE(LLP,124)(K,ICCC(I),VALLCH(I),I=1,J)
          NCHEAD=NCHEAD+J
C
C  READ AND WRITE INITIAL RIGHT BOUNDARY HEAD VALUES
       45 J=0
          K=IDWTR(NCOL)
```

```
      READ(LCR,122)(IRBND(I),I=1,K)
      DO 50 I=1,K
      IF(IRBND(I).EQ.0)GO TO 50
      J=J+1
      ICCC(J)=I
   50 CONTINUE
      IF(J.EQ.0)GO TO 55
      READ(LCR,113)(VALRCH(I),I=1,J)
      WRITE(LLP,128)
  128 FORMAT(/1X,'RIGHT BOUNDARY'/)
      WRITE(LLP,120)
      K=NCOL
      WRITE(LLP,124)(K,ICCC(I),VALRCH(I),I=1,J)
      NCHEAD=NCHEAD+J
C
C  READ AND WRITE THE INITIAL BOTTOM BOUNDARY HEAD VALUES
   55 J=0
      READ(LCR,122)(IBBND(I),I=1,NCOL)
      DO 60 I=1,NCOL
      IF(IBBND(I).EQ.0)GO TO 60
      J=J+1
      ICCC(J)=I
   60 CONTINUE
      IF(J.EQ.0)GO TO 65
      READ(LCR,113)(VALBCH(I),I=1,J)
      WRITE(LLP,129)
  129 FORMAT(/1X,'BOTTOM BOUNDARY'/)
      WRITE(LLP,120)
      K=1
      WRITE(LLP,124)(ICCC(I),K,VALBCH(I),I=1,J)
      NCHEAD=NCHEAD+J
C
C  ESTIMATE PARAMETERS FOR EXECUTION TIME DIMENSIONING OF ARRAYS
   65 NVCELL=NROW-1
      NHCELL=NCOL-1
      NNODEE=NROW*NCOL
      NELME=(NROW-1)*(NCOL-1)*2
      NHELM=NCOL+1
      NVELM=NROW*2-1
      NB=NROW+2
C
C  READ AND WRITE UNIT CODE MAPS
  105 FORMAT(16X,80I1)
  106 FORMAT(I5,1E10.4)
  107 FORMAT(1X,I5,5X,1E10.4)
C
C  HORIZONTAL HYDRAULIC CONDUCTIVITY CODE
      WRITE(LLP,131)
  131 FORMAT(1H1//,10X,' HORIZONTAL CONDUCTIVITY LEGEND',/)
      DO 230 K=1,NCOH
      READ(LCR,106) IDGEO,COH(IDGEO)
```

```
306       230 WRITE(LLP,107)IDGEO,COH(IDGEO)
307           WRITE(LLP,137)
308       137 FORMAT(//,20X,' HORIZONTAL CONDUCTIVITY CODE',/)
309           DO 235 K=1,NVCELL
310           J=NVCELL-K+1
311           READ(LCR,122)(ICOH(I,J),I=1,NHCELL)
312       235 WRITE(LLP,105)(ICOH(I,J),I=1,NHCELL)
313       C
314       C  VERTICAL HYDRAULIC CONDUCTIVITY CODE
315           WRITE(LLP,141)
316       141 FORMAT(1H1//,10X,' VERTICAL CONDUCTIVITY LEGEND',/)
317           DO 240 K=1,NCOV
318           READ(LCR,106) IDGEO,COV(IDGEO)
319       240 WRITE(LLP,107)IDGEO,COV(IDGEO)
320           WRITE(LLP,143)
321       143 FORMAT(//,20X,' VERTICAL CONDUCTIVITY CODE',/)
322           DO 245 K=1,NVCELL
323           J=NVCELL-K+1
324           READ(LCR,122)(ICOV(I,J),I=1,NHCELL)
325       245 WRITE(LLP,105)(ICOV(I,J),I=1,NHCELL)
326       C
327       C  LONGITUDINAL DISPERSIVITY CODE
328           WRITE(LLP,151)
329       151 FORMAT(1H1//,10X,' LONGITUDINAL DISPERSIVITY LEGEND',/)
330           DO 250 K=1,NRET
331           READ(LCR,106) IDGEO,RET(IDGEO)
332       250 WRITE(LLP,107)IDGEO,RET(IDGEO)
333           WRITE(LLP,153)
334       153 FORMAT(//,20X,' LONGITUDINAL DISPERSIVITY CODE',/)
335           DO 255 K=1,NVCELL
336           J=NVCELL-K+1
337           READ(LCR,122)(IRET(I,J),I=1,NHCELL)
338       255 WRITE(LLP,105)(IRET(I,J),I=1,NHCELL)
339       C
340       C  POROSITY CODE
341           WRITE(LLP,161)
342       161 FORMAT(1H1//,10X,' POROSITY LEGEND',/)
343           DO 260 K=1,NPOR
344           READ(LCR,106) IDGEO,POR(IDGEO)
345       260 WRITE(LLP,107)IDGEO,POR(IDGEO)
346           WRITE(LLP,163)
347       163 FORMAT(//,20X,' POROSITY CODE',/)
348           DO 265 K=1,NVCELL
349           J=NVCELL-K+1
350           READ(LCR,122)(IPOR(I,J),I=1,NHCELL)
351       265 WRITE(LLP,105)(IPOR(I,J),I=1,NHCELL)
352       C
353       C  CATION EXCHANGE CAPACITY CODE
354           WRITE(LLP,171)
355       171 FORMAT(1H1//,10X,'CATION EXCHANGE CAPACITY LEGEND',/)
356           DO 270 K=1,NCEC
```

```
      READ(LCR,106) IDGEO,CEC(IDGEO)
  270 WRITE(LLP,107)IDGEO,CEC(IDGEO)
      WRITE(LLP,173)
  173 FORMAT(//,20X,' CATION EXCHANGE CAPACITY CODE',/)
      DO 275 K=1,NVCELL
      J=NVCELL-K+1
      READ(LCR,122)(ICEC(I,J),I=1,NHCELL)
  275 WRITE(LLP,105)(ICEC(I,J),I=1,NHCELL)
C
C  PARTICLE TRANSPORT CODE
      WRITE(LLP,181)
  181 FORMAT(1H1//10X,'PARTICLE TRANSPORT CODE:'/' (0 = MOVEMENT,
     1       ' 1 = NO MOVEMENT'/)
      DO 280 K=1,NVCELL
      J=NVCELL-K+1
      READ(LCR,122)(PTC(I,J),I=1,NHCELL)
  280 WRITE(LLP,105)(PTC(I,J),I=1,NHCELL)
C
C  START THE VARIOUS SIMULATIONS
C
C  CALCULATE NODE CO-ORDINATES AND ASSIGN NODE TYPES
      CALL FEGRID(ICOV,ICOH,COH,COV,ILBND,IRBND,ITBND,IBBND,VALLCH,
     1            VALRCH,VALTCH,VALBCH,IC(2),IC(3),IC(4),IDWTR,CHEAD,
     2            X,Z,ANGLE,TYPE,IN,CX,CZ,NCHEAD)
C
C  CALCULATE THE TOTAL HEAD VALUES AT EACH NODE
      CALL HEADS(IC(5),IC(6),LPH,IDWTR,X,Z,ANGLE,TYPE,IN,S,F,HEAD,CX,
     1           CZ,CHEAD,LC,SC,PHI,NCHEAD)
C
C  CALCULATE THE VELOCITY FIELD AND OUTPUT VALUES
      IF(IC(7).EQ.1)CALL VEL(POR,IPOR,IC(8),IDWTR,VX,VZ,CX,CZ,HEAD,
     1                       IBBND,ILBND,IRBND)
C
C   CALCULATE THE TIME-STEPS AND OUTPUT VALUES
      IF(IC(9).EQ.1)CALL ESCAPE(IC(10),IC(11),LPTS,IDWTR,VX,VZ,EXT)
C
C  MASS TRANSPORT FUNCTION
      IF(IC(1).EQ.1)CALL DISPER(LCOL,LROW,PTC,NPER,RET,IRET,CEC,ICEC,
     1                          POR,IPOR,DELT,NTIME,NRCELL,IC(12),IC(13),
     2                          IC(14),LPDP,LPCD,IDWTR,VX,VZ,CONR,COT,AT,
     3                          COUNT,CONP,SOLUTE,SELC,BULK,RADHAF,NSKIP,
     4                          ASSI,ILBND,ITBND,IRBND,IBBND)
      STOP
      END
C*******************************************************************************
      SUBROUTINE FEGRID(ICOV,ICOH,COH,COV,ILBND,IRBND,ITBND,IBBND,
     2                  VALLCH,VALRCH,VALTCH,VALBCH,IC2,IC3,IC4,IDWTR,
     2                  CHEAD,X,Z,ANGLE,TYPE,IN,CX,CZ,NCHEAD)
C*******************************************************************************
C
```

```
C  SUBROUTINE TO SET UP THE NODES, CO-ORDINATES, ELEMENTS AND ELEMENT
C  INCIDENCES THAT COMPRISE THE LINEAR TRIANGULAR FINITE ELEMENT GRID
C
C*************************************************************************
C
C              SUBROUTINE PARAMETERS AND VARIABLES
C
C  ANGLE : ANGLE OF INCLINATION OF THE HYDRAULIC CONDUCTIVITY FROM
C          THE HORIZONTAL PLANE
C  CHEAD : VECTOR CONTAINING ALL CONSTANT HEAD VALUES
C  COH   : HORIZONTAL HYDRAULIC CONDUCTIVITY ASSIGNED TO A GEOLOGIC UNIT
C  COV   : VERTICAL HYDRAULIC CONDUCTIVITY ASSIGNED TO A GEOLOGIC UNIT
C  CX    : HORIZONTAL HYDRAULIC CONDUCTIVITY OF AN ELEMENT
C  CZ    : VERTICAL HYDRAULIC CONDUCTIVITY OF AN ELEMENT
C  DELX  : HORIZONTAL NODE SPACING, IN FEET
C  DELZ  : VERTICAL NODE SPACING, IN FEET
C  ICOH  : HORIZONTAL HYDRAULIC CONDUCTIVITY CODE IDENTIFYING EACH UNIT
C  ICOV  : VERTICAL HYDRAULIC CONDUCTIVITY CODE IDENTIFYING EACH UNIT
C  IDWTR : ROW NUMBER (OF EACH COLUMN OF NODES) THAT DEFINES THE
C          POSITION OF THE WATER TABLE
C  IEL   : ELEMENT NUMBER COUNTER
C  IGT   : NODE NUMBER COUNTER
C  IN    : FINITE ELEMENT INCIDENCES
C  IRBND : CODE WHICH IDENTIFIES WHICH RIGHT BOUNDARY NODES ARE CONSTANT
C  IBBND : CODE WHICH IDENTIFIES WHICH BOTTOM BOUNDARY NODES ARE CONSTANT
C  ITBND : CODE WHICH IDENTIFIES WHICH WATER TABLE NODES ARE CONSTANT
C  ILBND : CODE WHICH IDENTIFIES WHICH LEFT BOUNDARY NODES ARE CONSTANT
C  NCHEAD: NUMBER OF CONSTANT HEAD NODES
C  LLP   : UNIT NUMBER ASSIGNED TO THE LINE PRINTER
C  NCOL  : NUMBER OF COLUMNS OF NODES
C  NELM  : ACTUAL NUMBER OF ELEMENTS IN THE FINITE ELEMENT GRID
C  NELME : ESTIMATED NUMBER OF ELEMENTS IN THE FINITE ELEMENT GRID
C  NFS   : UPPERMOST ROW OF A COLUMN, THAT DEFINES THE POSITION OF THE
C          WATER TABLE
C  NHCELL: NUMBER OF CELLS, HORIZONTAL DIRECTION
C  NNODE : ACTUAL NUMBER OF NODES IN THE FINITE ELEMENT GRID
C  NNODEE: ESTIMATED NUMBER OF NODES IN THE FINITE ELEMENT GRID
C  NROW  : NUMBER OF ROWS OF NODES
C  TYPE  : NODE TYPE IDENTIFIER (1=CONSTANT HEAD; 0=VARIABLE HEAD)
C  VALTCH: CONSTANT HEAD VALUES ASSIGNED TO THE WATER TABLE NODES
C  VALLCH: CONSTANT HEAD VALUES ASSIGNED TO THE LEFT BOUNDARY NODES
C  VALBCH: CONSTANT HEAD VALUES ASSIGNED TO THE BOTTOM BOUNDARY NODES
C  VALRCH: CONSTANT HEAD VALUES ASSIGNED TO THE RIGHT BOUNDARY NODES
C  X     : X CO-ORDINATE OF A NODE
C  Z     : Z CO-ORDINATE OF A NODE
C
C*************************************************************************
C
C
      INTEGER*2 IDWTR(NCOL),ICOH(NCOL,NROW),ICOV(NCOL,NROW),IN(NELME,3),
     1       TYPE(NNODEE),ILBND(NROW),IRBND(NROW),ITBND(NCOL),
```

```
     2        IBBND(NCOL)
      REAL*8 DELX,DELZ,CHEAD(NCHEAD),CX(NELME),CZ(NELME)
      REAL X(NNODEE),Z(NNODEE),VALLCH(NROW),VALRCH(NROW),VALTCH(NCOL),
     1        VALBCH(NCOL),ANGLE(NELME),COH(10),COV(10)
      COMMON DELX,DELZ,LLP,NROW,NCOL,NNODE,NELM,NHELM,NVELM,NHCELL,
     1        NVCELL,NNODEE,NELME,NB
C
      IGT=0
      K=0
      KK=0
      KI=0
      KJ=0
      KL=0
C
C  SET UP X AND Z CO-ORDINATES OF THE NODES AND DESIGNATE WHICH ARE
C  CONSTANT HEAD NODES
      DO 20 I=1,NCOL
      DO 25 J=1,NROW
      IF(J.GT.IDWTR(I))GO TO 20
      IGT=IGT+1
      X(IGT)=FLOAT(I)*DELX-DELX
      Z(IGT)=FLOAT(J)*DELZ-DELZ
      IF(J.EQ.IDWTR(I) .AND. ITBND(I).EQ.1)GO TO 23
      IF(I.EQ.1 .AND. ILBND(J).EQ.1)GO TO 21
      IF(I.EQ.NCOL .AND. IRBND(J).EQ.1)GO TO 22
      IF(J.EQ.1 .AND. IBBND(I).EQ.1)GO TO 24
      TYPE(IGT)=0
      GO TO 25
   23 K=K+1
      KI=KI+1
      CHEAD(K)=VALTCH(KI)
      TYPE(IGT)=1
      GO TO 20
   21 K=K+1
      KJ=KJ+1
      CHEAD(K)=VALLCH(KJ)
      TYPE(IGT)=1
      GO TO 25
   22 K=K+1
      KK=KK+1
      CHEAD(K)=VALRCH(KK)
      TYPE(IGT)=1
      GO TO 25
   24 K=K+1
      KL=KL+1
      CHEAD(K)=VALBCH(KL)
      TYPE(IGT)=1
   25 CONTINUE
   20 CONTINUE
      NNODE=IGT
C
```

```
C  OUTPUT NODE CO-ORDINATES AND NODE TYPES
      IF(IC2.EQ.0)GO TO 6
      WRITE(LLP,101)
  101 FORMAT(1H1//' FINITE ELEMENT GRID NODE CO-ORDINATES'//,1X,
     1       3('NODE  TYPE',10X,'X',13X,'Z',11X)/)
      WRITE(LLP,102)(IGT,TYPE(IGT),X(IGT),Z(IGT),IGT=1,NNODE)
  102 FORMAT(1X,I4,I6,2F14.3,8X,I4,I6,2F14.3,8X,I4,I6,2F14.3)
C
C  CALCULATE ELEMENT INCIDENCES AND ASSIGN HYDRAULIC CONDUCTIVITIES
    6 IEL=0
      IGT=0
      DO 10 I=1,NHCELL
      NFS=IDWTR(I)
      DO 10 J=1,NFS
      IGT=IGT+1
      IF(J.GT.IDWTR(I+1)-1)GO TO 10
      IF(J.GT.IDWTR(I)-1)GO TO 10
      DO 15 K=1,2
      IEL=IEL+1
      IF(K.EQ.2)GO TO 7
      IN(IEL,1)=IGT
      IN(IEL,2)=IGT+IDWTR(I)
      IN(IEL,3)=IGT+IDWTR(I)+1
      GO TO 8
    7 IN(IEL,1)=IGT
      IN(IEL,2)=IGT+IDWTR(I)+1
      IN(IEL,3)=IGT+1
    8 ANGLE(IEL)=0.0
      CX(IEL)=COH(ICOH(I,J))
      CZ(IEL)=COV(ICOV(I,J))
   15 CONTINUE
   10 CONTINUE
      NELM=IEL
C
C  OUTPUT ELEMENT INCIDENCES AND HYDRAULIC CONDUCTIVITIES
      IF(IC3.EQ.0)GO TO 235
      WRITE(LLP,132)
  132 FORMAT(1H1/' ELEMENT INCIDENCES'///1X,
     1       4('ELEMENT    INCIDENCES',6X),'ELEMENT    INCIDENCES'/)
      WRITE(LLP,134)(IEL,(IN(IEL,J),J=1,3),IEL=1,NELM)
  134 FORMAT(1X,I5,':',3I5,I11,':',3I5,I11,':',3I5,I11,':',3I5,I11,
     1       ':',3I5)
  235 IF(IC4.EQ.0) RETURN
      WRITE(LLP,133)
  133 FORMAT(1H1/' ELEMENT HYDRAULIC CONDUCTIVITIES'///12X,
     1       'HYDRAUL. COND.',2(27X,'HYDRAUL. COND.'))
      WRITE(LLP,138)
  138 FORMAT(1X,3('ELEMENT    (HORZ.    VERT.)    ANGLE',5X)/)
      WRITE(LLP,139)(IEL,CX(IEL),CZ(IEL),ANGLE(IEL),IEL=1,NELM)
  139 FORMAT(1X,I5,':  ',E10.4,1X,E10.4,F7.2,I10,':  ',E10.4,1X,
     1       E10.4,F7.2,I10,':  ',E10.4,1X,E10.4,F7.2)
```

```
      RETURN
      END
C
C*************************************************************************
      SUBROUTINE HEADS(IC5,IC6,LPH,IDWTR,X,Z,ANGLE,TYPE,IN,S,F,HEAD,
     1                 CX,CZ,CHEAD,LC,SC,PHI,NCHEAD)
C*************************************************************************
C
C  SUBROUTINE WHICH CALCULATES THE STEADY-STATE HYDRAULIC HEAD DISTRIBUTION
C  IN A TWO-DIMENSIONAL CROSS-SECTION COMPRISED OF LINEAR TRIANGULAR
C  FINITE ELEMENTS.
C
C*************************************************************************
C
C       SUBROUTINE PARAMETERS AND VARIABLES
C
C  ANGLE : ANGLE OF INCLINATION OF THE HYDRAULIC CONDUCTIVITY FROM
C          THE HORIZONTAL PLANE
C  ALPHA : ANGLE OF INCLINATION IN RADIANS
C  BX    : HORIZONTAL SHAPE FUNCTION
C  BZ    : VERTICAL SHAPE FUNCTION
C  CHEAD : CONSTANT HEAD VALUES
C  DEL   : AREA OF A FINITE ELEMENT
C  F     : FLUX VECTOR
C  HEAD  : HYDRAULIC HEAD VALUES
C  IDWTR : ROW NUMBER (OF EACH COLUMN OF NODES) THAT DEFINES THE
C          POSITION OF THE WATER TABLE
C  IN    : ELEMENT INCIDENCES
C  LLP   : UNIT NUMBER ASSIGNED TO THE LINE PRINTER
C  LPH   : UNIT NUMBER ASSIGNED TO THE DEVICE INTO WHICH THE HEAD VALUES
C          ARE STORED FOR PLOTTING
C  N     : NUMBER OF DEGREES OF FREEDOM (NODES WITH UNKNOWN HEAD VALUES)
C  NB    : ESTIMATED BANDWIDTH
C  NB1   : ACTUAL BANDWIDTH
C  NCHEAD: TOTAL NUMBER OF CONSTANT HEAD NODES
C  NCOL  : NUMBER OF COLUMNS OF NODES
C  NELME : ESTIMATED NUMBER OF ELEMENTS IN THE FINITE ELEMENT GRID
C  NELM  : ACTUAL NUMBER OF ELEMENTS IN THE FINITE ELEMENT GRID
C  NNODE : NUMBER OF NODES
C  NNODEE: ESTIMATED NUMBER OF NODES IN THE FINITE ELEMENT GRID
C  NROW  : NUMBER OF ROWS OF NODES
C  PHI   : MATRIX OF HEAD VALUES FOR OUTPUT TO A PLOTTING FILE
C  SE    : ELEMENT CONDUCTIVITY MATRIX
C  S     : GLOBAL CONDUCTIVITY MATRIX
C  TYPE  : NODE TYPE IDENTIFIER
C
C*************************************************************************
C
      COMMON DELX,DELZ,LLP,NROW,NCOL,NNODE,NELM,NHELM,NVELM,NHCELL,
     1       NVCELL,NNODEE,NELME,NB
      INTEGER*2 IN(NELME,3),LC(NNODEE),IDWTR(NCOL),TYPE(NNODEE)
```

```
      REAL*8 S(NNODEE,NB),SC(NNODEE,NCHEAD),B(3),C(3),CX(NELME),
     1       CZ(NELME),SE(3,3),CHEAD(NCHEAD),F(NNODEE),HEAD(NNODEE),
     2       BX,BZ,DEL,DELX,DELZ
      REAL ANGLE(NELME),X(NNODEE),Z(NNODEE),XI(3),ZI(3),PHI(NCOL,NROW)
C
C  CONDENSATION CODE
      LC(1) = 0
      IF (TYPE(1).EQ.1) LC(1)=1
      DO 20 IGT=2,NNODE
      K = 0
      IF (TYPE(IGT).EQ.1) K=1
   20 LC(IGT) = LC(IGT-1)+K
      N = NNODE-NCHEAD
C
C  OUTPUT FINITE ELEMENT GRID SUMMARY
      WRITE(LLP,141)NNODE,NELM,NB,NCHEAD,N
  141 FORMAT(1H1///1X,'FINITE ELEMENT GRID SUMMARY'//9X,
     1     'NUMBER OF NODES',I19/9X,'NUMBER OF ELEMENTS',I16/9X,
     2     'ESTIMATED BANDWIDTH',I15/9X,'NUMBER OF CONSTANT-HEAD NODES'
     3     ,I5/9X,'NUMBER OF DEGREES OF FREEDOM',I6)
C
C  CLEAR ARRAYS
      DO 30 I=1,N
      DO 40 J=1,NB
   40 S(I,J) = 0.
      DO 30 J=1,NCHEAD
   30 SC(I,J) = 0.
C
C  LOOP OVER ELEMENTS
      NB1 = 0
      DO 70 IEL=1,NELM
C
C  ELEMENT CONDUCTIVITY MATRIX
      ALPHA = ANGLE(IEL)*3.141593/180.
      COSA = COS(ALPHA)
      SINA = SIN(ALPHA)
      DO 50 I=1,3
      J = IN(IEL,I)
      XI(I) = COSA*X(J)+SINA*Z(J)
   50 ZI(I) = COSA*Z(J)-SINA*X(J)
C
C  SHAPE FUNCTIONS
      B(1) = ZI(2)-ZI(3)
      B(2) = ZI(3)-ZI(1)
      B(3) = ZI(1)-ZI(2)
      C(1) = XI(3)-XI(2)
      C(2) = XI(1)-XI(3)
      C(3) = XI(2)-XI(1)
      DEL = XI(2)*ZI(3)-XI(3)*ZI(2)-XI(1)*ZI(3)+XI(3)*ZI(1)+XI(1)*
     1     ZI(2)-XI(2)*ZI(1)
      BZ =  .5*CZ(IEL)/DEL
```

```
663           BX =  .5*CX(IEL)/DEL
664           DO 55 I=1,3
665           DO 55 J=1,3
666        55 SE(I,J) = BX*B(I)*B(J)+BZ*C(I)*C(J)
667     C
668     C  GLOBAL CONDUCTIVITY MATRIX
669           DO 60 I=1,3
670           KI = IN(IEL,I)
671           IF (TYPE(KI).EQ.1) GO TO 60
672           II = KI-LC(KI)
673           DO 65 J=1,3
674           KJ = IN(IEL,J)
675           IF (TYPE(KJ).EQ.1) GO TO 64
676           JJ = KJ-LC(KJ)-II+1
677           IF (JJ.LT.1) GO TO 65
678           IF (JJ.GT.NB1) NB1=JJ
679           IF (JJ.LE.NB) GO TO 63
680           WRITE (LLP,991) IEL,JJ
681       991 FORMAT (//10X,'ELEMENT',I4,2X,'REQUIRES BANDWIDTH OF',I4)
682           GO TO 65
683        63 S(II,JJ) = S(II,JJ)+SE(I,J)
684           GO TO 65
685        64 CONTINUE
686           JJ = LC(KJ)
687           SC(II,JJ) = SC(II,JJ)+SE(I,J)
688        65 CONTINUE
689        60 CONTINUE
690     C
691     C  END OF ELEMENT LOOP
692        70 CONTINUE
693     C
694           WRITE (LLP,151) NB1
695       151 FORMAT(9X,'FINAL BANDWIDTH',15X,I4)
696           IF (NB1.LE.NB) GO TO 72
697           WRITE (LLP,993)
698       993 FORMAT (//10X,'EXECUTION TERMINATED - BANDWIDTH EXCEEDED')
699           STOP
700        72 NB = NB1
701     C
702     C  DECOMPOSE THE GLOBAL CONDUCTIVITY MATRIX
703           CALL DBAND (N,S)
704     C
705     C  FLUX VECTOR
706           DO 85 I=1,N
707           F(I)=0.
708           DO 85 K=1,NCHEAD
709           F(I)=F(I)-SC(I,K)*CHEAD(K)
710        85 CONTINUE
711     C
712     C  SOLVE FOR HEAD VALUES
713           CALL SBAND (N,S,F,HEAD)
```

```
      C
      C  EXPAND HEAD VECTOR
            KK=NCHEAD
            DO 90 J=1,NNODE
            IGT=NNODE-J+1
            IF (TYPE(IGT).EQ.1) GO TO 91
            K=IGT-LC(IGT)
            HEAD(IGT)=HEAD(K)
            GO TO 90
         91 HEAD(IGT)=CHEAD(KK)
            KK=KK-1
         90 CONTINUE
      C
      C  OUTPUT STEADY-STATE HYDRAULIC HEAD DISTRIBUTION
            IF(IC5.EQ.0)GO TO 92
            WRITE(LLP,101)
        101 FORMAT(1H1///1X,'STEADY-STATE HYDRAULIC HEAD DISTRIBUTION'///
           1       1X,5(' NODE    TOTAL-HEAD',5X)/)
            WRITE(LLP,102)(IGT,HEAD(IGT),IGT=1,NNODE)
        102 FORMAT(1X,I5,F13.3,I10,F13.3,I10,F13.3,I10,F13.3,I10,F13.3)
      C
      C  PREPARE DATA FOR HEAD PLOT
         92 IF(IC6.EQ.0)RETURN
            IGT=0
            DO 96 I=1,NCOL
            DO 96 J=1,NROW
            IF(J.GT.IDWTR(I))GO TO 98
            IGT=IGT+1
            PHI(I,J)=HEAD(IGT)
            GO TO 96
         98 PHI(I,J)=1.0E35
         96 CONTINUE
            DO 97 J=1,NROW
         97 WRITE(LPH,825)(PHI(I,J),I=1,NCOL)
        825 FORMAT(10E12.5)
            RETURN
            END
      C*******************************************************************************
            SUBROUTINE DBAND (N,S)
      C*******************************************************************************
      C
      C  SUBROUTINE WHICH DECOMPOSES THE GLOBAL CONDUCTIVITY MATRIX BY THE
      C  CHOLESKY SQUARE ROOT METHOD FOR SYMMETRIC, BANDED MATRICES
      C
      C*******************************************************************************
      C
            COMMON DELX,DELZ,LLP,NROW,NCOL,NNODE,NELM,NHELM,NVELM,NHCELL,
           1       NVCELL,NNODEE,NELME,NB
            REAL*8 S(NNODEE,NB),TEMP,DSQRT,SUM,DELX,DELZ
            DO 20 I=1,N
            IP = N-I+1
```

```
      IF (NB.LT.IP) IP=NB
      DO 20 J=1,IP
      IQ = NB-J
      IF ((I-1).LT.IQ) IQ=I-1
      SUM = S(I,J)
      IF (IQ.LT.1) GO TO 25
      DO 30 K=1,IQ
      II = I-K
      JZ = J+K
   30 SUM = SUM - S(II,K+1)*S(II,JZ)
   25 IF (J.NE.1) GO TO 23
      IF (SUM.LE.0.) GO TO 26
      TEMP = 1./DSQRT(SUM)
      S(I,J) = TEMP
      GO TO 20
   26 WRITE (LLP,999) I
  999 FORMAT(///10X,'DECOMPOSITION FAILED - EXECUTION TERMINATED'/
     1       10X,19HDBAND FAILS AT ROW   ,I4 )
      STOP
   23 S(I,J) = SUM*TEMP
   20 CONTINUE
      RETURN
      END
C*******************************************************************************
      SUBROUTINE SBAND (N,S,F,HEAD)
C*******************************************************************************
C
C  SUBROUTINE WHICH SOLVES FOR THE UNKNOWNS IN A SYSTEM OF LINEAR
C  EQUATIONS BY BACK SUBSTITUTION OF THE DECOMPOSED GLOBAL
C  CONDUCTIVITY MATRIX
C
C*******************************************************************************
C
      REAL*8 S(NNODEE,NB),HEAD(NNODEE),F(NNODEE),SUM,DELX,DELZ
      COMMON DELX,DELZ,LLP,NROW,NCOL,NNODE,NELM,NHELM,NVELM,NHCELL,
     1       NVCELL,NNODEE,NELME,NB
      DO 20 I=1,N
      J = I-NB+1
      IF ((I+1).LE.NB) J=1
      SUM = F(I)
      K1 = I-1
      IF (J.GT.K1) GO TO 24
      DO 30 K=J,K1
      II = I-K+1
   30 SUM = SUM - S(K,II)*HEAD(K)
   24 HEAD(I) = SUM*S(I,1)
   20 CONTINUE
      DO 40 I1=1,N
      I = N-I1+1
      J = I+NB-1
      IF (J.GT.N) J=N
```

```
816           SUM = HEAD(I)
817           K2 = I+1
818           IF (K2.GT.J) GO TO 25
819           DO 50 K=K2,J
820           KK = K-I+1
821        50 SUM = SUM - S(I,KK)*HEAD(K)
822        25 HEAD(I) = SUM*S(I,1)
823        40 CONTINUE
824           RETURN
825           END
826     C*******************************************************************************
827           SUBROUTINE VEL(POR,IPOR,IC8,IDWTR,VX,VZ,CX,CZ,HEAD,IBBND,
828          1                ILBND,IRBND)
829     C*******************************************************************************
830     C
831     C  SUBROUTINE WHICH CALCULATES THE HORIZONTAL AND VERTICAL DARCY VELOCITIES
832     C  FOR EACH FINITE ELEMENT IN THE CROSS-SECTION
833     C
834     C*******************************************************************************
835     C
836     C         SUBROUTINE PARAMETERS AND VARIABLES
837     C
838     C  CX     : HORIZONTAL HYDRAULIC CONDUCTIVITY OF AN ELEMENT
839     C  CZ     : VERTICAL HYDRAULIC CONDUCTIVITY OF AN ELEMENT
840     C  DELX   : HORIZONTAL NODE SPACING, IN FEET
841     C  DELZ   : VERTICAL NODE SPACING, IN FEET
842     C  HEAD   : CALCULATED HEAD DISTRIBUTION
843     C  ICC    : HORIZONTAL ELEMENT COUNTER
844     C  IBBND  : CODE WHICH IDENTIFIES WHICH BOTTOM BOUNDARY NODES ARE CONSTANT
845     C  ITBND  : CODE WHICH IDENTIFIES WHICH WATER TABLE NODES ARE CONSTANT
846     C  ILBND  : CODE WHICH IDENTIFIES WHICH LEFT BOUNDARY NODES ARE CONSTANT
847     C  IRR    : VERTICAL ELEMENT COUNTER
848     C  IDWTR  : ROW NUMBER (OF EACH COLUMN OF NODES) THAT DEFINES THE
849     C           POSITION OF THE WATER TABLE
850     C  IN     : FINITE ELEMENT INCIDENCES
851     C  IEL    : ELEMENT NUMBER COUNTER
852     C  IGT    : NODE NUMBER COUNTER
853     C  IPOR   : POROSITY CODE IDENTIFYING CELLS IN EACH GEOLOGIC UNIT
854     C  NCOL   : NUMBER OF COLUMNS OF NODES
855     C  NELME  : ESTIMATED NUMBER OF ELEMENTS IN THE FINITE ELEMENT GRID
856     C  NHCELL: NUMBER OF CELLS IN THE HORIZONTAL DIRECTION
857     C  NHELM  : NUMBER OF ELEMENTS IN THE HORIZONTAL DIRECTION
858     C  NNODEE: ESTIMATED NUMBER OF NODES IN THE FINITE ELEMENT GRID
859     C  NROW   : NUMBER OF ROWS OF NODES
860     C  NVELM  : NUMBER OF ELEMENTS IN THE VERTICAL DIRECTION
861     C  POR    : POROSITY VALUE ASSIGNED TO A GEOLOGIC UNIT
862     C  VX     : GROUNDWATER VELOCITY IN THE HORIZONTAL DIRECTION
863     C  VZ     : GROUNDWATER VELOCITY IN THE VERTICAL DIRECTION
864     C
865     C*******************************************************************************
866     C
```

```
      COMMON DELX,DELZ,LLP,NROW,NCOL,NNODE,NELM,NHELM,NVELM,NHCELL,
     1       NVCELL,NNODEE,NELME,NB
      REAL POR(10)
      REAL*8 DELX,DELZ,VX(NHELM,NVELM),VZ(NHELM,NVELM),HEAD(NNODEE),
     1       CX(NELME),CZ(NELME)
      INTEGER*2 IDWTR(NCOL),IPOR(NCOL,NROW),IBBND(NCOL),ILBND(17),
     1          IRBND(17)
      IGT=0
      IEL=0
      ICC=1
      DO 20 I=1,NHCELL
      IRR=1
      ICC=ICC+1
      DO 25 J=1,NVCELL
      IF(J.GT.IDWTR(I+1)-1)GO TO 26
      IF(J.GT.IDWTR(I)-1)GO TO 26
      IGT=IGT+1
      DO 30 K=1,2
      IRR=IRR+1
      IEL=IEL+1
      IF(K.EQ.2)GO TO 22
      I1=IGT
      I2=IGT+IDWTR(I)
      I3=IGT+IDWTR(I)+1
      VX(ICC,IRR)=((HEAD(I1)-HEAD(I2))/DELX)*CX(IEL)/POR(IPOR(I,J))
      VZ(ICC,IRR)=((HEAD(I2)-HEAD(I3))/DELZ)*CZ(IEL)/POR(IPOR(I,J))
      GO TO 30
   22 I1=IGT
      I2=IGT+IDWTR(I)+1
      I3=IGT+1
      VX(ICC,IRR)=((HEAD(I3)-HEAD(I2))/DELX)*CX(IEL)/POR(IPOR(I,J))
      VZ(ICC,IRR)=((HEAD(I1)-HEAD(I3))/DELZ)*CZ(IEL)/POR(IPOR(I,J))
   30 CONTINUE
      GO TO 25
   26 IRR=IRR+2
      VX(ICC,IRR)=0.0
      VZ(ICC,IRR)=0.0
      VX(ICC,IRR-1)=0.0
      VZ(ICC,IRR-1)=0.0
   25 CONTINUE
      IGT=IGT+1
   20 CONTINUE
C
C  ADD DUMMY ROWS AND COLUMNS
      DO 40 J=2,NVELM
      VX(1,J)=-VX(2,J)
      IF(ILBND(J/2).EQ.1 .AND. ILBND(J/2+1).EQ.1)VX(1,J)=VX(2,J)
      VZ(1,J)= VZ(2,J)
      VX(NCOL+1,J)=-VX(NCOL,J)
      IF(IRBND(J/2).EQ.1 .AND. IRBND(J/2+1).EQ.1)VX(NCOL+1,J)=VX(NCOL,J)
   40 VZ(NCOL+1,J)= VZ(NCOL,J)
```

```
      DO 50 I=1,NHELM
      VZ(I,1)=-VZ(I,2)
      IF(I.EQ.1 .OR. I.EQ.NHELM)GO TO 50
      IF(IBBND(I-1).EQ.1 .AND. IBBND(I).EQ.1)VZ(I,1)=VZ(I,2)
   50 VX(I,1)=VX(I,2)
C
C  PRINT THE VELOCITY FIELD
      IF(IC8.EQ.0)RETURN
      WRITE(LLP,101)
  101 FORMAT(1H1/1X,'VELOCITY FIELD')
      J=0
   42 J=J+9
      KI=J-8
      IF(NHELM.LT.J)J=NHELM
      WRITE(LLP,104)(I,I=KI,J)
  104 FORMAT(//1X,8X,'COLUMN:',I3,8I13)
      DO 80 I=1,NVELM
      KK=NVELM+1-I
      WRITE(LLP,106)KK,(VX(K,KK),K=KI,J)
  106 FORMAT(/1X,'ROW',I3,'  HORZ:',9(3X,E10.4))
      WRITE(LLP,107)(VZ(K,KK),K=KI,J)
  107 FORMAT(1X,8X,'VERT:',9(3X,E10.4))
   80 CONTINUE
      IF(J.LT.NHELM)GO TO 42
C
      RETURN
      END
C*************************************************************************
      SUBROUTINE DISPER(LCOL,LROW,PTC,NPER,RET,IRET,CEC,ICEC,POR,IPOR,
     1                  DELT,NTIME,NRCELL,IC12,IC13,IC14,LPDP,LPCD,
     2                  IDWTR,VX,VZ,CONR,COT,AT,COUNT,CONP,SOLUTE,SELC,
     3                  BULK,RADHAF,NSKIP,ASSI,ILBND,ITBND,IRBND,IBBND)
C*************************************************************************
C
C  SUBROUTINE WHICH TRANSPORTS PARTICLES THROUGH THE CROSS-SECTION BY MOVING
C  THE PARTICLES FROM ONE CELL TO THE NEXT BY RANDOM MOTION WITHIN THE
C  VELOCITY FIELD
C
C*************************************************************************
C
C          SUBROUTINE PARAMETERS AND VARIABLES
C
C  ASS    : MASS ASIGNED TO EACH PARTICLE
C  ASSI   : INITIAL MASS OF THE PARTICLES
C  AT     : CONCENTRATION OF THE CONTAMINANT IN THE SYSTEM (ONE VALUE
C           FOR EACH CELL)
C  BULK   : BULK DENSITY OF THE GEOLOGIC MEDIUM
C  CEC    : CATION EXCHANGE CAPACITY VALUES ASSIGNED TO A GEOLOGIC UNIT
C  CONP   : PREVIOUS CONCENTRATION OF THE CONTAMINANT IN THE SYSTEM
C  COT    : DISTRIBUTION OF THE PARTICLES THAT HAVE LEFT THE CONFINING
C           BED (NUMBER OF PARTICLES PER CELL)
```

```
969     C  COUNT : DISTRIBUTION OF PARTICLES IN THE CONFINING BED ( TOTAL
970     C           NUMBER OF PARTICLES PER CELL)
971     C  DELT  : SIZE OF THE TIME-STEP, IN DAYS
972     C  DELX  : HORIZONTAL NODE SPACING, IN FEET
973     C  DELZ  : VERTICAL NODE SPACING, IN FEET
974     C  DIST  : DISTANCE A PARTICLE MOVES
975     C  IDWTR : ROW NUMBER (OF EACH COLUMN OF NODES) THAT DEFINES THE
976     C           POSITION OF THE WATER TABLE
977     C  ICEC  : CATION EXCHANGE CAPACITY CODE IDENTIFYING CELLS IN EACH UNIT
978     C  IPOR  : POROSITY CODE IDENTIFYING CELLS IN EACH UNIT
979     C  IRET  : LONGITUDINAL DISPERSIVITY CODE IDENTIFYING CELLS IN EACH UNIT
980     C  IX    : RANDOM NUMBER GENERATOR SEED
981     C  IXE   : COLUMN NUMBER OF THE ELEMENT WHICH CONTAINS THE PARTICLE
982     C  IZE   : ROW NUMBER OF THE ELEMENT WHICH CONTAINS THE PARTICLE
983     C  IY    : RANDOM NUMBER GENERATOR SEED
984     C  KFLAG : TIME-STEP COUNTER
985     C  KNPER : NUMBER OF PARTICLES ADDED AT A PARTICULAR TIME-STEP
986     C  LCOL  : COLUMN IDENTIFIER FOR CELLS WHICH INITIALLY RECEIVE THE CONTAMINANT
987     C  LLP   : UNIT NUMBER ASSIGNED TO THE LINE PRINTER
988     C  LROW  : ROW IDENTIFIER FOR CELLS WHICH INITIALLY RECEIVE THE CONTAMINANT
989     C  LPCD  : UNIT NUMBER ASSIGNED TO THE DEVICE INTO WHICH THE CONCENTRATION
990     C           DISTRIBUTION OF PARTICLES ARE STORED FOR PLOTTING
991     C  LPDH  : UNIT NUMBER ASSIGNED TO THE DEVICE INTO WHICH THE DISTRIBUTION
992     C           OF PARTICLES ARE STORED FOR PLOTTING
993     C  ME    : COUNTER TO DETERMINE THE NUMBER OF TIME-STEPS THAT PASS
994     C           BEFORE RESULTS ARE OUTPUT
995     C  NP    : PARTICLE COUNTER
996     C  NXX   : TOTAL NUMBER OF PARTICLES THAT HAVE LEFT THE CONFINING BED
997     C  NCOL  : NUMBER OF COLUMNS OF NODES
998     C  NHELM : NUMBER OF ELEMENTS IN THE HORIZONTAL DIRECTION
999     C  NPER  : NUMBER OF CONTAMINANT PARTICLES ADDED DURING EACH TIME-STEP
1000    C  NROW  : NUMBER OF ROWS OF NODES
1001    C  NRCELL: NUMBER OF CELLS WHICH INITIALLY RECEIVE CONTAMINANTS
1002    C  NTIME : TOTAL NUMBER OF TIME-STEPS
1003    C  NSKIP : NUMBER OF TIME-STEPS THAT PASS BEFORE RESULTS ARE PRINTED
1004    C  NVELM : NUMBER OF ELEMENTS IN THE VERTICAL DIRECTION
1005    C  POR   : POROSITY VALUES ASSIGNED TO A GEOLOGIC UNIT
1006    C  PTC   : PARTICLE TRANSPORT CODE (IDENTIFIES CELLS WHERE PARTICLES
1007    C           ARE ALLOWED TO MOVE)
1008    C  RADHAF: RADIOACTIVE HALF-LIFE OF THE CONTAMINANT
1009    C  RDC   : RADIOACTIVE DECAY COEFFICIENT
1010    C  RET   : LONGITUDINAL DISPERSIVITY VALUES ASSIGNED TO EACH GEOLOGIC UNIT
1011    C  RONE  : RANDOM NUMBER USED TO CALCULATE THE DISPERSION OF A PARTICLE
1012    C  RTWO  : RANDOM NUMBER USED TO CALCULATE THE DISPERSION OF A PARTICLE
1013    C  SOLUTE: TOTAL CONCENTRATION OF THE CONTAMINANT IN SOLUTION
1014    C  TIME  : TOTAL TIME THAT HAS PASSED, IN DAYS
1015    C  VEL   : AVERAGE VELOCITY OF A PARTICLE
1016    C  VEX   : HORIZONTAL VELOCITY OF A PARTICLE
1017    C  VEZ   : VERTICAL VELOCITY OF A PARTICLE
1018    C  VX    : GROUNDWATER VELOCITY IN THE HORIZONTAL DIRECTION
1019    C  VZ    : GROUNDWATER VELOCITY IN THE VERTICAL DIRECTION
```

```
1020      C  XMAX   : TOTAL LENGTH OF THE CROSS-SECTION
1021      C  XOB    : FORMER X CO-ORDINATE OF A PARTICLE
1022      C  XPOS   : X CO-ORDINATE OF THE LOCATION OF A PARTICLE
1023      C  YEAR   : TOTAL TIME THAT HAS PASSED, IN YEARS
1024      C  YFL    : RANDOM NUMBER
1025      C  ZMAX   : TOTAL HEIGHT OF THE CROSS-SECTION
1026      C  ZOB    : FORMER Z CO-ORDINATE OF A PARTICLE
1027      C  ZPOS   : Z CO-ORDINATE OF THE LOCATION OF A PARTICLE
1028      C
1029      C*******************************************************************************
1030      C
1031            COMMON DELX,DELZ,LLP,NROW,NCOL,NNODE,NELM,NHELM,NVELM,NHCELL,
1032           1       NVCELL,NNODEE,NELME,NB
1033            INTEGER*2 LCOL(NRCELL),LROW(NRCELL),PTC(NCOL,NROW),IDWTR(NCOL),
1034           1       ILBND(NROW),ITBND(NCOL),IRBND(NROW),IBBND(NCOL),
1035           2       IPOR(NCOL,NROW),IRET(NCOL,NROW),ICEC(NCOL,NROW)
1036            INTEGER NPER(NRCELL,NTIME)
1037            REAL*8 DELX,DELZ,VX(NHELM,NVELM),VZ(NHELM,NVELM)
1038            REAL CONR(NCOL,NROW),COT(NCOL,NROW),XPOS(8000),
1039           1     ZPOS(8000),AT(NCOL,NROW),ASS(8000),COUNT(NCOL,NROW),
1040           2     RET(10),POR(10),CEC(10),CONP(NCOL,NROW)
1041            IX=512275045
1042            TIME=0.0
1043            ME=0
1044            NXX=0
1045            KFLAG=1
1046            RDC=0.0
1047            IF (RADHAF.GT.0.0) RDC=ALOG(2.0)/RADHAF
1048            WRITE (LLP,101)
1049          101 FORMAT (1H1,'      ****   BEGIN SIMULATION   ****')
1050            DO 10 I=1,NHCELL
1051            DO 10 J=1,NVCELL
1052            CONR(I,J)=1.0
1053            COT(I,J)=0.0
1054           10 CONTINUE
1055      C
1056      C  LOOP THROUGH THE SIMULATION
1057      C
1058      C  ADD NEW POINTS TO GRID AND RANDOMLY PLACE THEM IN THE SOURCE CELL
1059            NP=0
1060           1 DO 20 K=1,NRCELL
1061            KNPER=NPER(K,KFLAG)
1062            DO 25 J=1,KNPER
1063            NP=NP+1
1064            CALL RANDU(IX,IY,YFL)
1065            IX=IY
1066            XPOS(NP)=FLOAT(LCOL(K)-1)*DELX+YFL*DELX
1067            CALL RANDU(IX,IY,YFL)
1068            IX=IY
1069            LLRR=LROW(K)
1070            ZPOS(NP)=FLOAT(LLRR)*DELZ-.5*DELZ
```

```
1071            ASS(NP)=ASSI
1072          25 CONTINUE
1073          20 CONTINUE
1074      C
1075            DO 30 I=1,NHCELL
1076            DO 30 J=1,NVCELL
1077            AT(I,J)=0.0
1078          30 COUNT(I,J)=0.0
1079      C
1080            XMAX=FLOAT(NHCELL)*DELX
1081            TIME=TIME+DELT
1082            ME=ME+1
1083            KONT=2
1084      C
1085      C  MOVE PARTICLES ONE AT A TIME
1086            DO 50 K=1,NP
1087            IF (XPOS(K).LT.0.0) GO TO 30
1088      C
1089      C  INTERPOLATE VELOCITIES AT THE LOCATION OF EACH PARTICLE
1090            FIXE=(XPOS(K)+1.5*DELX)/DELX
1091            IXE=IFIX(FIXE)
1092            XLOCAL=FIXE-FLOAT(IXE)
1093            FIZE=(ZPOS(K)+.75*DELZ)/(DELZ/2.0)
1094            IZE=IFIX(FIZE)
1095            ZLOCAL=FIZE-FLOAT(IZE)
1096            XELX1=VX(IXE,IZE)+XLOCAL*(VX(IXE+1,IZE)-VX(IXE,IZE))
1097            XELX2=VX(IXE,IZE+1)+XLOCAL*(VX(IXE+1,IZE+1)-VX(IXE,IZE+1))
1098            VEX=XELX1+ZLOCAL*(XELX2-XELX1)
1099            ZELX1=VZ(IXE,IZE)+ZLOCAL*(VZ(IXE,IZE+1)-VZ(IXE,IZE))
1100            ZELX2=VZ(IXE+1,IZE)+ZLOCAL*(VZ(IXE+1,IZE+1)-VZ(IXE+1,IZE))
1101            VEZ=ZELX1+XLOCAL*(ZELX2-ZELX1)
1102            VEL=SQRT(VEX**2+VEZ**2)
1103      C
1104      C  FIND ROW AND COLUMN NUMBER OF THE CELL WHICH CONTAINS THE PARTICLE
1105            IXE=(XPOS(K)+DELX)/DELX
1106            IZE=(ZPOS(K)+DELZ)/DELZ
1107            ASS(K)=ASS(K)*CONR(IXE,IZE)
1108      C
1109      C  GENERATE RANDOM NUMBERS TO RANDOMLY MOVE THE PARTICLES
1110            CALL RANDU(IX,IY,YFL)
1111            IX=IY
1112            RONE=YFL
1113            CALL RANDU(IX,IY,YFL)
1114            IX=IY
1115            RTWO=YFL
1116            DLI=SQRT((RET(IRET(IXE,IZE))*VEL+2.8E-4)*24.*DELT)
1117            DTI=SQRT((RET(IRET(IXE,IZE))*VEL*.25+2.8E-4)*24.*DELT)
1118            RONE=.5-RONE
1119            RTWO=.5-RTWO
1120            ZOB=ZPOS(K)
1121            XOB=XPOS(K)
```

```
1122            XPOS(K)=XPOS(K)+DELT*VEX
1123            ZPOS(K)=ZPOS(K)+DELT*VEZ
1124            DIST=SQRT((XPOS(K)-XOB)**2+(ZPOS(K)-ZOB)**2)
1125      C
1126      C  MOVE PARTICLES TO A NEW POSITION
1127            XPOS(K)=XOB+DELT*VEX+VEX*DLI*RONE*DELT/DIST+VEZ*DTI*RTWO*DELT/DIST
1128            ZPOS(K)=ZOB+DELT*VEZ+VEZ*DLI*RONE*DELT/DIST+VEX*DTI*RTWO*DELT/DIST
1129      C
1130      C  FIND ROW AND COLUMN NUMBER OF THE CELL WHICH CONTAINS THE PARTICLE
1131            IXE=(XPOS(K)+DELX)/DELX
1132            IZE=(ZPOS(K)+DELZ)/DELZ
1133      C
1134      C  CHECK BOUNDARY CONDITIONS ON PARTICLE MOTION
1135            IF(IZE.LT.0 .OR. IZE.GT.NVCELL) GO TO 47
1136         40 IF(XPOS(K).GT.0.0) GO TO 41
1137            IF(ILBND(IZE).EQ.1 .AND. ILBND(IZE+1).EQ.1) GO TO 51
1138            XPOS(K)=-1.*XPOS(K)+.00005*DELX
1139            GO TO 42
1140         41 IF(XPOS(K).LT.XMAX) GO TO 43
1141            IF(IRBND(IZE).EQ.1 .AND. IRBND(IZE+1).EQ.1) GO TO 51
1142            XPOS(K)=2.*XMAX-XPOS(K)-.00005*DELX
1143         42 IXE=(XPOS(K)+DELX)/DELX
1144         47 IF(IXE.LT.0 .OR. IXE.GT.NHCELL) GO TO 40
1145         43 IF(ZPOS(K).GT.0.0) GO TO 44
1146            IF(IBBND(IXE).EQ.1 .AND. IBBND(IXE+1).EQ.1) GO TO 51
1147            ZPOS(K)=-1.*ZPOS(K)+.00005*DELZ
1148            GO TO 46
1149         44 IT1=IDWTR(IXE)
1150            IT2=IDWTR(IXE+1)
1151            ZMAX=FLOAT(MINO(IT1,IT2)-1)*DELZ
1152            IF(ZPOS(K).LT.ZMAX) GO TO 49
1153            IF(ITBND(IXE).EQ.1 .AND. ITBND(IXE+1).EQ.1) GO TO 51
1154            ZPOS(K)=2.*ZMAX-ZPOS(K)-.00005*DELZ
1155         46 IZE=(ZPOS(K)+DELZ)/DELZ
1156      C
1157      C  CHECK TO SEE IF THE PARTICLE IS IN A REGION OF NO MOVEMENT
1158         49 IF(PTC(IXE,IZE).EQ.1)GO TO 52
1159            COUNT(IXE,IZE)=COUNT(IXE,IZE)+1
1160            IF (RDC.GT.0.0) ASS(K)=ASS(K)*EXP(-RDC*DELT)
1161            AT(IXE,IZE)=AT(IXE,IZE)+ASS(K)
1162            GO TO 50
1163         52 NXX=NXX+1
1164            COT(IXE,IZE)=COT(IXE,IZE)+1.0
1165         51 XPOS(K)=-1.0
1166      C
1167      C  END PARTICLE MOVEMENT LOOP
1168         50 CONTINUE
1169      C
1170      C  CALCULATE CONCENTRATION AND DISTRIBUTION OF PARTICLES IN A CELL
1171            DO 80 I=1,NHCELL
1172            DO 80 J=1,NVCELL
```

```
1173            IF (AT(I,J).EQ.0.0) GO TO 80
1174            CONI=AT(I,J)/(POR(IPOR(I,J))*DELX*DELZ*28.316)
1175            BULL=BULK/POR(IPOR(I,J))
1176            AT(I,J)=(CONI+BULL*SELC*CEC(ICEC(I,J))*CONP(I,J)/SOLUTE)/
1177           1        (1.+BULL*SELC*CEC(ICEC(I,J))/SOLUTE)
1178            CONR(I,J)=AT(I,J)/CONI
1179            CONP(I,J)=AT(I,J)
1180         80 CONTINUE
1181      C
1182            YEAR=TIME/365.
1183      C
1184      C  WRITE SIMULATION RESULTS
1185            IF(IC12.EQ.0)GO TO 14
1186            WRITE(LLP,130)YEAR
1187        130 FORMAT(1H1,'ELASPED TIME IN YEARS:',3X,F10.2/)
1188            WRITE(LLP,131)NP
1189        131 FORMAT(1H  ,'TOTAL NUMBER OF PARTICLES ADDED:',2X,I5/)
1190            DO 245 K=1,NRCELL
1191        245 WRITE(LLP,141)NPER(K,KFLAG),LROW(K),LCOL(K)
1192        141 FORMAT(1X,I5,' PARTICLES ADDED AT ROW',I3,', COLUMN',I3)
1193            WRITE(LLP,145)
1194        145 FORMAT(///' DISTRIBUTION OF NON-MOVING REFERENCE PARTICLES'/)
1195            WRITE(LLP,146)NXX,NP
1196        146 FORMAT(1X,I10,' OUT OF',I5,' PARTICLES HAVE LEFT THE CONFINING',
1197           1        ' BED'//)
1198            DO 250 I=1,NHCELL
1199        250 WRITE(LLP,150)(CONT(I,J),J=1,NVCELL)
1200        150 FORMAT(1X,25F5.0)
1201         14 IF(ME.LT.NSKIP)GO TO 5
1202            ME=0
1203            IF(IC12.EQ.0)GO TO 15
1204            WRITE(LLP,130)YEAR
1205            WRITE(LLP,160)
1206        160 FORMAT(//,' DISTRIBUTION OF REFERENCE PARTICLES',//)
1207            DO 255 I=1,NHCELL
1208        255 WRITE(LLP,162)(COUNT(I,J),J=1,NVCELL)
1209        162 FORMAT(1X,30F4.0)
1210            WRITE(LLP,130)YEAR
1211            WRITE(LLP,170)
1212        170 FORMAT(//,' CONCENTRATION DISTRIBUTION',//)
1213            DO 260 I=1,NHCELL
1214            WRITE(LLP,162)(AT(I,J),J=1,NVCELL)
1215        260 CONTINUE
1216      C
1217      C  OUTPUT DISTRIBUTION OF PARTICLES TO A PLOTTING FILE
1218         15 IF(IC13.EQ.0)GO TO 16
1219            WRITE(LPDP,851)YEAR
1220        851 FORMAT(1F10.1)
1221            DO 810 J=1,NVCELL
1222        810 WRITE(LPDP,852)(COUNT(I,J),I=1,NHCELL)
1223        852 FORMAT(10E10.4)
```

```
1224      C
1225      C  OUTPUT CONCENTRATION DISTRIBUTION TO A PLOTTING FILE
1226         16 IF(IC14.EQ.0)GO TO 5
1227            WRITE(LPCD,851)YEAR
1228            DO 820 J=1,NVCELL
1229        820 WRITE(LPCD,852)(AT(I,J),I=1,NHCELL)
1230      C
1231      C  END OF SIMULATION LOOP
1232          5 KFLAG=KFLAG+1
1233            IF (KFLAG.LE.NTIME) GO TO 1
1234            RETURN
1235            END
1236      C*******************************************************************************
1237            SUBROUTINE RANDU(IX,IY,R)
1238      C*******************************************************************************
1239      C
1240      C  SUBROUTINE WHICH GENERATES PSEUDO-RANDOM NUMBERS BETWEEN 0 AND 1
1241      C
1242      C*******************************************************************************
1243      C
1244            IY=IX*65539
1245            IF (IY) 10,20,20
1246         10 IY=IY+2147483647+1
1247         20 R=IY
1248            R=R*.4656613E-9
1249            RETURN
1250            END
1251      C*******************************************************************************
1252            SUBROUTINE ESCAPE(IC10,IC11,LPTS,IDWTR,VX,VZ,EXT)
1253      C*******************************************************************************
1254      C
1255      C  SUBROUTINE WHICH CALCULATES THE MINIMUM TIME REQUIRED FOR A PARTICLE TO
1256      C  LEAVE A CELL UNDER THE INFLUENCE OF THE GROUNDWATER VELOCITY FIELD ONLY.
1257      C
1258      C*******************************************************************************
1259      C
1260      C        SUBROUTINE PARAMETERS AND VARIABLES
1261      C
1262      C  DELX   : HORIZONTAL NODE SPACING, IN FEET
1263      C  DELZ   : VERTICAL NODE SPACING, IN FEET
1264      C  EXT    : MINIMUM TIME REQUIRED FOR A PARTICLE TO LEAVE A CELL UNDER THE
1265      C           INFLUENCE OF GROUNDWATER FLOW ONLY
1266      C  IDWTR  : ROW NUMBER (OF EACH COLUMN OF NODES) THAT DEFINES THE
1267      C           POSITION OF THE WATER TABLE
1268      C  LLP    : UNIT NUMBER ASSIGNED TO THE LINE PRINTER
1269      C  LPTS   : UNIT NUMBER ASSIGNED TO THE DEVICE INTO WHICH THE TIME-STEP
1270      C           VALUES ARE STORED FOR PLOTTING
1271      C  NCOL   : NUMBER OF COLUMNS OF NODES
1272      C  NHCELL: NUMBER OF CELLS IN THE HORIZONTAL DIRECTION
1273      C  NHELM  : NUMBER OF ELEMENTS IN THE HORIZONTAL DIRECTION
1274      C  NROW   : NUMBER OF ROWS OF NODES
```

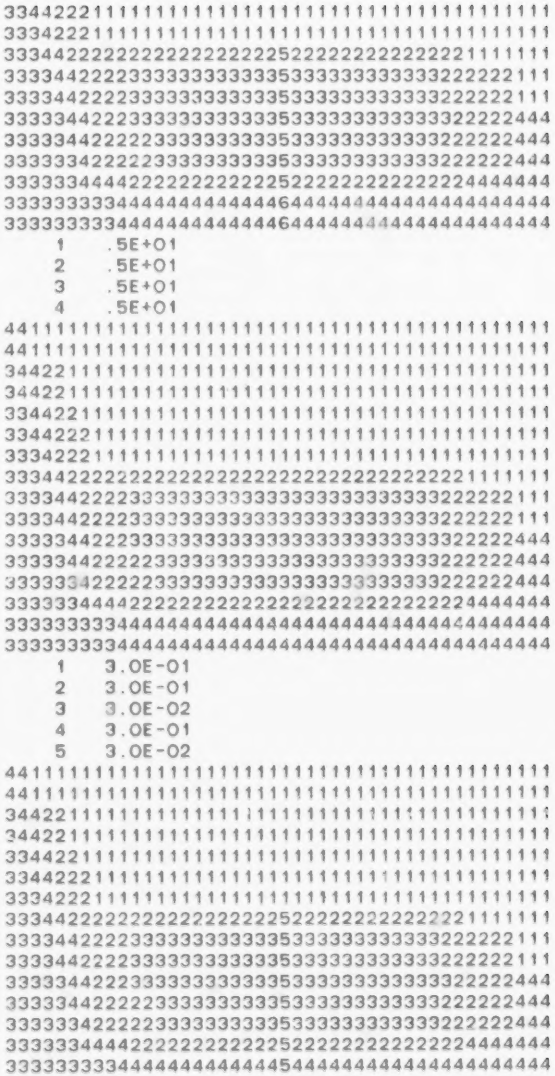
```
C  NVCELL: NUMBER OF CELLS IN THE VERTICAL DIRECTION
C  NVELM : NUMBER OF ELEMENTS IN THE VERTICAL DIRECTION
C  VX    : GROUNDWATER VELOCITY IN THE HORIZONTAL DIRECTION
C  VXX   : AVERAGE HORIZONTAL GROUNDWATER VELOCITY IN A CELL
C  VZ    : GROUNDWATER VELOCITY IN THE VERTICAL DIRECTION
C  VZZ   : AVERAGE VERTICAL GROUNDWATER VELOCITY IN A CELL
C
C*******************************************************************************
C
      COMMON DELX,DELZ,LLP,NROW,NCOL,NNODE,NELM,NHELM,NVELM,NHCELL,
     1       NVCELL,NNODEE,NELME,NB
      REAL*8 VX(NHELM,NVELM),VZ(NHELM,NVELM),DELX,DELZ
      REAL EXT(NCOL,NROW)
      INTEGER*2 IDWTR(NCOL)
C
      DO 30 I=1,NHCELL
      IRR=1
      DO 30 J=1,NVCELL
      IF(J.GT.IDWTR(I)-1)GO TO 31
      IF(J.GT.IDWTR(I+1)-1)GO TO 31
      VXX=0.0
      VZZ=0.0
      DO 40 K=1,2
      IRR=IRR+1
      VXX=VXX+.5*VX(I+1,IRR)
      VZZ=VZZ+.5*VZ(I+1,IRR)
   40 CONTINUE
      VXX=DELX*.5/ABS(VXX)
      VZZ=DELZ*.5/ABS(VZZ)
      EXT(I,J)=AMIN1(VXX,VZZ)
      EXT(I,J)=ALOG10(EXT(I,J))
      GO TO 30
   31 EXT(I,J)=35.
   30 CONTINUE
C
C  OUTPUT PARTICLE TIME-STEP GUIDE FIELD
      IF(IC10.EQ.0)GO TO 5
      WRITE(LLP,101)
  101 FORMAT(1H1,1X,'TIME FOR PARTICLES TO LEAVE EACH CELL'/1X,
     1       '(ALL VALUES EXPRESSED AS ANTILOG BASE 10)')
      K=0
    7 K=K+25
      KM=K-24
      IF(NHCELL.LT.K)K=NHCELL
      WRITE(LLP,102)(I,I=KM,K)
  102 FORMAT(//1X,'COLUMN:',25I5/)
      DO 80 J=1,NVCELL
      JM=NVCELL-J+1
      WRITE(LLP,104)(EXT(I,JM),I=KM,K)
  104 FORMAT(1X,7X,25F5.1)
   80 CONTINUE
```

```
 1326            IF(K.GE.NHCELL)GO TO 8
 1327            WRITE(LLP,105)
 1328        105 FORMAT(1X///)
 1329            GO TO 7
 1330          8 WRITE(LLP,106)
 1331        106 FORMAT(1H1)
 1332      C
 1333      C   OUTPUT PARTICLE TIME-STEP GUIDE TO THE PLOTTING FILE
 1334          5 IF(IC11.EQ.0)RETURN
 1335            DO 830 J=1,NVCELL
 1336        830 WRITE(LPTS,811)(EXT(I,J),I=1,NHCELL)
 1337        811 FORMAT(15F7.3)
 1338            RETURN
 1339            END
END OF FILE
```

APPENDIX 4:

EXAMPLE INPUT CARD DECK

```
RADIOACTIVE WASTE REPOSITORY: EXAMPLE 1.
    1    1    1    1    1    0    1    1    1    1    0    1    0    0
   17   45    1   25    5
    6931.       150.  1825.E4
    6    6    4    5    4
         .1       0.0       1.0       -1.    500000.
   16    6  100  100  100  100  100  100  100  100  100  100  100  100  100  1000
  100  100  100  100  100  100  100  100  100  100  100
 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17
 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17
1111111111111111111111100000000000000000000001
     6100.      6075.      6050.      6025.      5925.      5750.      5600.      5525.
     5500.      5475.      5415.      5355.      5295.      5235.      5175.      5115.
     5055.      4995.      4935.      4875.      4815.      4715.      4615.      2500.
00000000000000000
00000000000000000
000000000000000000000000000000000000000000000000000
    1   5.0E+01
    2   1.0E-02
    3   1.0E-05
    4   4.0E+01
    5   5.0E-06
    6   4.0E+00
44111111111111111111111111111111111111111111111111
44111111111111111111111111111111111111111111111111
34422111111111111111111111111111111111111111111111
34422111111111111111111111111111111111111111111111
33442211111111111111111111111111111111111111111111
33442221111111111111111111111111111111111111111111
33342221111111111111111111111111111111111111111111
33344222222222222222252222222222222221111111
33334422223333333333353333333333332222222111
33334422223333333333353333333333332222222111
33333442223333333333353333333333332222222444
33333442222233333333353333333333332222222444
33333342222233333333353333333333332222222444
33333344442222222222225222222222222224444444
33333333344444444444446444444444444444444444
33333333344444444444446444444444444444444444
    1   1.4E+00
    2   1.0E-03
    3   1.0E-06
    4   7.0E+01
    5   5.0E-07
    6   7.0E-01
44111111111111111111111111111111111111111111111111
44111111111111111111111111111111111111111111111111
34422111111111111111111111111111111111111111111111
34422111111111111111111111111111111111111111111111
33442211111111111111111111111111111111111111111111
```


1 .5E+01
2 .5E+01
3 .5E+01
4 .5E+01
1 3.0E-01
2 3.0E-01
3 3.0E-02
4 3.0E-01
5 3.0E-02

```
333333333444444444444454444444444444444444444
    1   1.0E-01
    2   1.0E-01
    3   1.0E-01
    4   1.0E-01
441111111111111111111111111111111111111111111
441111111111111111111111111111111111111111111
344221111111111111111111111111111111111111111
344221111111111111111111111111111111111111111
334422111111111111111111111111111111111111111
334422211111111111111111111111111111111111111
333422211111111111111111111111111111111111111
333442222222222222222222222222222221111111
333344222233333333333333333333333222222111
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333334422222333333333333333333333222222444
333333422222333333333333333333333222222444
333333444422222222222222222222222224444444
333333333444444444444444444444444444444444
333333333444444444444444444444444444444444
111111111111111111111111111111111111111111
111111111111111111111111111111111111111111
011111111111111111111111111111111111111111
011111111111111111111111111111111111111111
001111111111111111111111111111111111111111
001111111111111111111111111111111111111111
000111111111111111111111111111111111111111
000111111111111111111111111111111111111111
000011111100000000000000000000000011111111
000011111100000000000000000000000011111111
000001111100000000000000000000000011111111
000001111100000000000000000000000011111111
000001111100000000000000000000000011111111
000000111111000000000000000000000011111111
000000111111111111111111111111111111111111
000000000011111111111111111111111111111111
000000000011111111111111111111111111111111
```
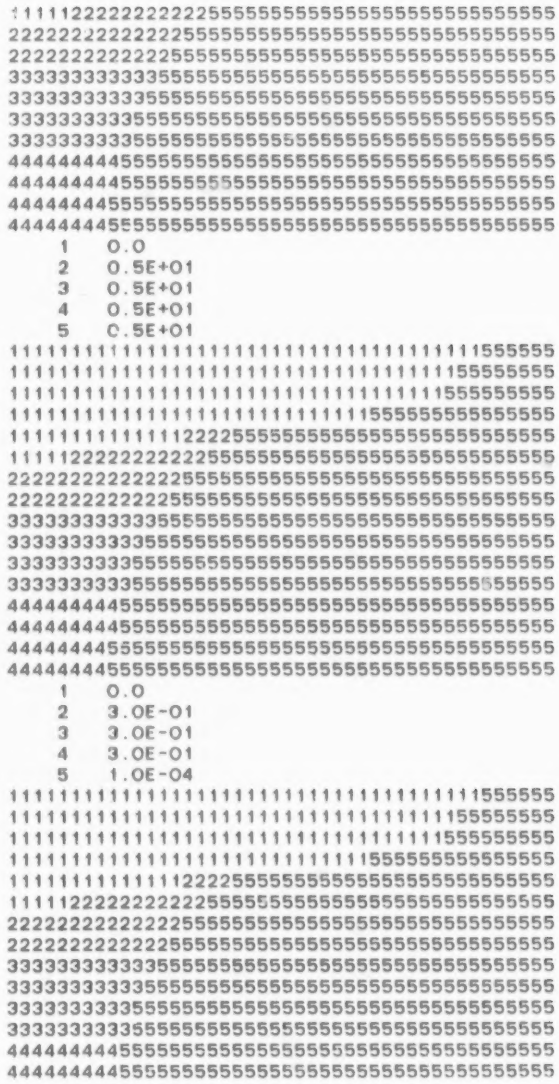

```
RADIOACTIVE WASTE REPOSITORY: EXAMPLE 2.
    1    0    0    0    0    0    1    0    1    0    0    1    1    1
   17   45    1    5    1
      500.       100.       1.5
    5    5    5    5    5
         .1       0.0       1.0       -1.       141.
   25    7   50   50   50   50   50
 11 11 11 11 11 12 12 12 12 12 12 12 12 12 13 13 13 13 13 13 13 13 13 13 13
 13 13 13 13 14 14 14 14 14 14 15 16 16 17 17 17 17 17 17 17
1111111111111111111111111111111111111111111111111
     3800.      3810.      3820.      3830.      3840.      3850.      3862.      3874.
     3887.      3900.      3915.      3930.      3945.      3960.      3985.      3990.
     3994.      3995.      3996.      3997.      3998.      3999.      4000.      4001.
     4002.      4003.      4010.      4025.      4040.      4055.      4070.      4095.
     4110.      4125.      4140.      4190.      4240.      4295.      4350.      4360.
     4390.      4403.      4410.      4415.      4420.
OOOOOOOOOOOOOOOO
OOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOO
OOOOOOOOOOOOOOOO
    1   0.0
    2   1.0E-02
    3   5.0E-02
    4   1.0E-01
    5   1.3E-01
11111111111111111111111111111111111111111111555555
11111111111111111111111111111111111111111155555555
11111111111111111111111111111111111111155555555555
11111111111111111111111111111111555555555555555555
11111111111111222255555555555555555555555555555555
11111222222222225555555555555555555555555555555555
22222222222222255555555555555555555555555555555555
22222222222222555555555555555555555555555555555555
33333333333355555555555555555555555555555555555555
33333333333555555555555555555555555555555555555555
33333333335555555555555555555555555555555555555555
33333333335555555555555555555555555555555555555555
44444444455555555555555555555555555555555555555555
44444444455555555555555555555555555555555555555555
44444444455555555555555555555555555555555555555555
44444444555555555555555555555555555555555555555555
    1   0.0
    2   1.0E-02
    3   5.0E-02
    4   1.0E-01
    5   1.3E-01
11111111111111111111111111111111111111111111555555
11111111111111111111111111111111111111111155555555
11111111111111111111111111111111111111155555555555
11111111111111111111111111111111555555555555555555
11111111111111222255555555555555555555555555555555
```


1 0.0
2 0.5E+01
3 0.5E+01
4 0.5E+01
5 0.5E+01
1 0.0
2 3.0E-01
3 3.0E-01
4 3.0E-01
5 1.0E-04

```
44444444555555555555555555555555555555555555
44444444555555555555555555555555555555555555
     1    0.0
     2    1.0E-01
     3    1.0E-01
     4    1.0E-01
     5    1.0E-01
11111111111111111111111111111111111111111555555
11111111111111111111111111111111111111155555555
11111111111111111111111111111111111115555555555
11111111111111111111111111111115555555555555555
11111111111112222255555555555555555555555555555
11111222222222225555555555555555555555555555555
22222222222222255555555555555555555555555555555
22222222222222555555555555555555555555555555555
33333333333355555555555555555555555555555555555
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33333333335555555555555555555555555555555555555
33333333335555555555555555555555555555555555555
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44444444555555555555555555555555555555555555555
44444444555555555555555555555555555555555555555
11111111111111111111111111111111111111111000000
11111111111111111111111111111111111111100000000
11111111111111111111111111111111111111000000000
11111111111111111111111111111111100000000000000
11111111111111111100000000000000000000000000000
11111111111111111000000000000000000000000000000
11111111111111100000000000000000000000000000000
11111111111111000000000000000000000000000000000
11111111111110000000000000000000000000000000000
11111111111100000000000000000000000000000000000
11111111111000000000000000000000000000000000000
11111111110000000000000000000000000000000000000
11111111100000000000000000000000000000000000000
11111111000000000000000000000000000000000000000
11111110000000000000000000000000000000000000000
```

APPENDIX 5:

EXAMPLE PRINTED OUTPUT LISTING

****

RADIOACTIVE WASTE REPOSITORY: EXAMPLE 1.

****

OUTPUT LISTINGS AND PROBLEM CONTROL; 1 = YES, 0 = NO

```
    1: RUN THE MASS TRANSPORT ROUTINE
    1: PRINT THE NODE CO-ORDINATES
    1: PRINT THE ELEMENT INCIDENCES
    1: PRINT THE ELEMENT HYDRAULIC CONDUCTIVITIES
    1: PRINT THE TOTAL HEAD VALUES
    0: OUTPUT THE HEAD VALUES TO A PLOTTING FILE
    1: CALCULATE THE VELOCITY FIELD
    1: PRINT THE VELOCITY FIELD
    1: RUN THE TIME-STEP GUIDE ROUTINE
    1: PRINT THE TIME-STEP GUIDE
    0: OUTPUT THE TIME-STEP GUIDE TO A PLOTTING FILE
    1: PRINT THE PARTICLE AND CONCENTRATION DISTRIBUTION
    0: OUTPUT THE PARTICLE DISTRIBUTION TO A PLOTTING FILE
    0: OUTPUT THE CONCENTRATION DISTRIBUTION TO A PLOTTING FILE
```


CROSS-SECTION SUMMARY

NUMBER OF ROWS:	17	NUMBER OF HORZ. CONDUCTIVITY UNITS:	6
NUMBER OF COLUMNS:	45	NUMBER OF VERT. CONDUCTIVITY UNITS:	6
HORZ. NODE SPACING:	6931.0	NUMBER OF LONG. DISPERSIVITY UNITS:	4
VERT. NODE SPACING:	150.0	NUMBER OF DIFFERENT POROSITY UNITS:	5
		NUMBER OF DIFFERENT C.E.C. UNITS:	4

CONTAMINANT PARAMETERS

RADIOACTIVE HALF-LIFE:	-1.00	NUMBER OF STEPS BETWEEN LISTINGS:	5
NUMBER OF STEPS IN TIME:	25	TOTAL CONCENTRATION IN SOLUTION:	0.1000
BULK DENSITY OF MEDIUM:	1.00	SELECTIVITY COEFFICIENT FOR EXCHANGE:	0.0
SIZE OF TIME-STEP:	18250000.00	INITIAL MASS ADDED PER PART:	500000.000

NUMBER OF PARTICLES ADDED TO THE SYSTEM PER TIME-STEP

ROW	COLUMN	PARTICLES ADDED PER STEP														
6	16	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
		100	100	100	100	100	100	100	100	100	100					

ROW AND COLUMN NUMBERS AND HEAD VALUES OF CONSTANT HEAD NODES

WATER TABLE

COLUMN	ROW	HEAD	COLUMN	ROW	HEAD	COLUMN	ROW	HEAD	COLUMN	ROW	HEAD	COLUMN	ROW	HEAD
1	17	6100.00	2	17	6075.00	3	17	6050.00	4	17	6025.00	5	17	5925.00
6	17	5750.00	7	17	5600.00	8	17	5525.00	9	17	5500.00	10	17	5475.00
11	17	5415.00	12	17	5355.00	13	17	5295.00	14	17	5235.00	15	17	5175.00
16	17	5115.00	17	17	5055.00	18	17	4995.00	19	17	4935.00	20	17	4875.00
21	17	4815.00	22	17	4715.00	23	17	4615.00	45	17	2500.00			

HORIZONTAL CONDUCTIVITY LEGEND

1	0.5000E+02
2	0.1000E-01
3	0.1000E-04
4	0.4000E+02
5	0.5000E-05
6	0.4000E+01

HORIZONTAL CONDUCTIVITY CODE

```
441111111111111111111111111111111111111111111111
441111111111111111111111111111111111111111111111
344221111111111111111111111111111111111111111111
344221111111111111111111111111111111111111111111
334422111111111111111111111111111111111111111111
334422211111111111111111111111111111111111111111
333422211111111111111111111111111111111111111111
333442222222222222222252222222222222211111111
333344222233333333333353333333333322222211
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333334422233333333333353333333333322222444
333334422222333333333353333333333322222444
333333422222333333333353333333333322222444
333333444422222222222522222222222224444444
333333333444444444444644444444444444444444
333333333444444444444644444444444444444444
```

VERTICAL CONDUCTIVITY LEGEND

1	0.1400E+01
2	0.1000E-02
3	0.1000E-05
4	0.7000E+02
5	0.5000E-06
6	0.7000E+00

VERTICAL CONDUCTIVITY CODE

```
44111111111111111111111111111111111111111111111111
44111111111111111111111111111111111111111111111111
34422111111111111111111111111111111111111111111111
34422111111111111111111111111111111111111111111111
33442211111111111111111111111111111111111111111111
33442221111111111111111111111111111111111111111111
33422211111111111111111111111111111111111111111111
33344222222222222222252222222222222221111111
33334422223333333333353333333333332222222111
33334422223333333333353333333333332222222111
33333442223333333333353333333333332222222444
33333442222233333333353333333333332222222444
33333342222233333333353333333333332222222444
33333344442222222222252222222222222244444444
33333333344444444444464444444444444444444444
33333333344444444444464444444444444444444444
```


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LONGITUDINAL DISPERSIVITY LEGEND

1	0.5000E+01
2	0.5000E+01
3	0.5000E+01
4	0.5000E+01

LONGITUDINAL DISPERSIVITY CODE

```
4411111111111111111111111111111111111111111111111
4411111111111111111111111111111111111111111111111
3442211111111111111111111111111111111111111111111
3442211111111111111111111111111111111111111111111
3344221111111111111111111111111111111111111111111
3344222111111111111111111111111111111111111111111
3334222111111111111111111111111111111111111111111
3334422222222222222222222222222222222221111111
3333442222333333333333333333333333222222111
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3333344222333333333333333333333333222222444
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3333334222223333333333333333333333222222444
3333334444222222222222222222222222224444444
3333333334444444444444444444444444444444444
3333333334444444444444444444444444444444444
```

POROSITY LEGEND

1	0.3000E+00
2	0.3000E+00
3	0.3000E-01
4	0.3000E+00
5	0.3000E-01

POROSITY CODE

```
44111111111111111111111111111111111111111111111111
44111111111111111111111111111111111111111111111111
34422111111111111111111111111111111111111111111111
34422111111111111111111111111111111111111111111111
33442211111111111111111111111111111111111111111111
33442221111111111111111111111111111111111111111111
33422211111111111111111111111111111111111111111111
33344222222222222222225222222222222221111111
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33333344442222222222225222222222222224444444
33333333344444444444454444444444444444444444
33333333344444444444454444444444444444444444
```
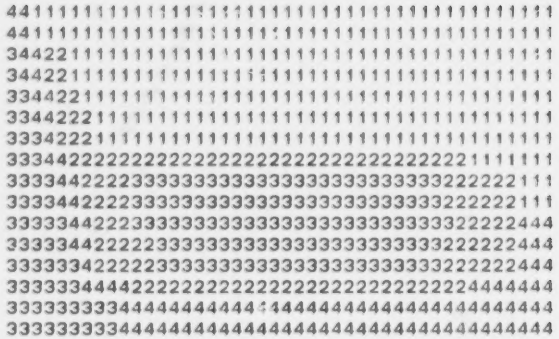
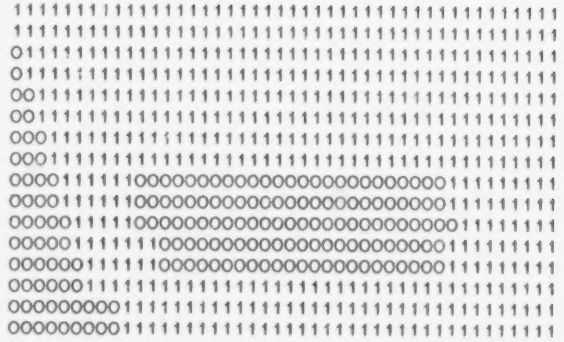

CATION EXCHANGE CAPACITY LEGEND

1	0.1000E+00
2	0.1000E+00
3	0.1000E+00
4	0.1000E+00

CATION EXCHANGE CAPACITY CODE



PARTICLE TRANSPORT CODE:
(0 = MOVEMENT, 1 = NO MOVEMENT



FINITE ELEMENT GRID NODE CO-ORDINATES

NODE	TYPE	X	Z	NODE	TYPE	X	Z	NODE	TYPE	X	Z
1	0	0.0	0.0	2	0	0.0	150.000	3	0	0.0	300.000
4	0	0.0	450.000	5	0	0.0	600.000	6	0	0.0	750.000
7	0	0.0	900.000	8	0	0.0	1050.000	9	0	0.0	1200.000
10	0	0.0	1350.000	11	0	0.0	1500.000	12	0	0.0	1650.000
13	0	0.0	1800.000	14	0	0.0	1950.000	15	0	0.0	2100.000
16	0	0.0	2250.000	17	1	0.0	2400.000	18	0	6931.000	0.0
19	0	6931.000	150.000	20	0	6931.000	300.000	21	0	6931.000	450.000
22	0	6931.000	600.000	23	0	6931.000	750.000	24	0	6931.000	900.000
25	0	6931.000	1050.000	26	0	6931.000	1200.000	27	0	6931.000	1350.000
28	0	6931.000	1500.000	29	0	6931.000	1650.000	30	0	6931.000	1800.000
31	0	6931.000	1950.000	32	0	6931.000	2100.000	33	0	6931.000	2250.000
34	1	6931.000	2400.000	35	0	13862.000	0.0	36	0	13862.000	150.000
37	0	13862.000	300.000	38	0	13862.000	450.000	39	0	13862.000	600.000
40	0	13862.000	750.000	41	0	13862.000	900.000	42	0	13862.000	1050.000
43	0	13862.000	1200.000	44	0	13862.000	1350.000	45	0	13862.000	1500.000
46	0	13862.000	1650.000	47	0	13862.000	1800.000	48	0	13862.000	1950.000
49	0	13862.000	2100.000	50	0	13862.000	2250.000	51	1	13862.000	2400.000
52	0	20793.000	0.0	53	0	20793.000	150.000	54	0	20793.000	300.000
55	0	20793.000	450.000	56	0	20793.000	600.000	57	0	20793.000	750.000
58	0	20793.000	900.000	59	0	20793.000	1050.000	60	0	20793.000	1200.000
61	0	20793.000	1350.000	62	0	20793.000	1500.000	63	0	20793.000	1650.000
64	0	20793.000	1800.000	65	0	20793.000	1950.000	66	0	20793.000	2100.000
67	0	20793.000	2250.000	68	1	20793.000	2400.000	69	0	27724.000	0.0
70	0	27724.000	150.000	71	0	27724.000	300.000	72	0	27724.000	450.000
73	0	27724.000	600.000	74	0	27724.000	750.000	75	0	27724.000	900.000
76	0	27724.000	1050.000	77	0	27724.000	1200.000	78	0	27724.000	1350.000
79	0	27724.000	1500.000	80	0	27724.000	1650.000	81	0	27724.000	1800.000
82	0	27724.000	1950.000	83	0	27724.000	2100.000	84	0	27724.000	2250.000
85	1	27724.000	2400.000	86	0	34655.000	0.0	87	0	34655.000	150.000
88	0	34655.000	300.000	89	0	34655.000	450.000	90	0	34655.000	600.000
91	0	34655.000	750.000	92	0	34655.000	900.000	93	0	34655.000	1050.000
94	0	34655.000	1200.000	95	0	34655.000	1350.000	96	0	34655.000	1500.000
97	0	34655.000	1650.000	98	0	34655.000	1800.000	99	0	34655.000	1950.000
100	0	34655.000	2100.000	101	0	34655.000	2250.000	102	1	34655.000	2400.000
103	0	41586.000	0.0	104	0	41586.000	150.000	105	0	41586.000	300.000
106	0	41586.000	450.000	107	0	41586.000	600.000	108	0	41586.000	750.000
109	0	41586.000	900.000	110	0	41586.000	1050.000	111	0	41586.000	1200.000
112	0	41586.000	1350.000	113	0	41586.000	1500.000	114	0	41586.000	1650.000
115	0	41586.000	1800.000	116	0	41586.000	1950.000	117	0	41586.000	2100.000
118	0	41586.000	2250.000	119	1	41586.000	2400.000	120	0	48517.000	0.0
121	0	48517.000	150.000	122	0	48517.000	300.000	123	0	48517.000	450.000
124	0	48517.000	600.000	125	0	48517.000	750.000	126	0	48517.000	900.000
127	0	48517.000	1050.000	128	0	48517.000	1200.000	129	0	48517.000	1350.000
130	0	48517.000	1500.000	131	0	48517.000	1650.000	132	0	48517.000	1800.000
133	0	48517.000	1950.000	134	0	48517.000	2100.000	135	0	48517.000	2250.000
136	1	48517.000	2400.000	137	0	55448.000	0.0	138	0	55448.000	150.000
139	0	55448.000	300.000	140	0	55448.000	450.000	141	0	55448.000	600.000
142	0	55448.000	750.000	143	0	55448.000	900.000	144	0	55448.000	1050.000
145	0	55448.000	1200.000	146	0	55448.000	1350.000	147	0	55448.000	1500.000
148	0	55448.000	1650.000	149	0	55448.000	1800.000	150	0	55448.000	1950.000
151	0	55448.000	2100.000	152	0	55448.000	2250.000	153	1	55448.000	2400.000
154	0	62379.000	0.0	155	0	62379.000	150.000	156	0	62379.000	300.000

157	0	62379.000	450.000	158	0	62379.000	600.000	159	0	62379.000	750.000
160	0	62379.000	900.000	161	0	62379.000	1050.000	162	0	62379.000	1200.000
163	0	62379.000	1350.000	164	0	62379.000	1500.000	165	0	62379.000	1650.000
166	0	62379.000	1800.000	167	0	62379.000	1950.000	168	0	62379.000	2100.000
169	0	62379.000	2250.000	170	1	62379.000	2400.000	171	0	69310.000	0.0
172	0	69310.000	150.000	173	0	69310.000	300.000	174	0	69310.000	450.000
175	0	69310.000	600.000	176	0	69310.000	750.000	177	0	69310.000	900.000
178	0	69310.000	1050.000	179	0	69310.000	1200.000	180	0	69310.000	1350.000
181	0	69310.000	1500.000	182	0	69310.000	1650.000	183	0	69310.000	1800.000
184	0	69310.000	1950.000	185	0	69310.000	2100.000	186	0	69310.000	2250.000
187	1	69310.000	2400.000	188	0	76241.000	0.0	189	0	76241.000	150.000
190	0	76241.000	300.000	191	0	76241.000	450.000	192	0	76241.000	600.000
193	0	76241.000	750.000	194	0	76241.000	900.000	195	0	76241.000	1050.000
196	0	76241.000	1200.000	197	0	76241.000	1350.000	198	0	76241.000	1500.000
199	0	76241.000	1650.000	200	0	76241.000	1800.000	201	0	76241.000	1950.000
202	0	76241.000	2100.000	203	0	76241.000	2250.000	204	1	76241.000	2400.000
205	0	83172.000	0.0	206	0	83172.000	150.000	207	0	83172.000	300.000
208	0	83172.000	450.000	209	0	83172.000	600.000	210	0	83172.000	750.000
211	0	83172.000	900.000	212	0	83172.000	1050.000	213	0	83172.000	1200.000
214	0	83172.000	1350.000	215	0	83172.000	1500.000	216	0	83172.000	1650.000
217	0	83172.000	1800.000	218	0	83172.000	1950.000	219	0	83172.000	2100.000
220	0	83172.000	2250.000	221	1	83172.000	2400.000	222	0	90103.000	0.0
223	0	90103.000	150.000	224	0	90103.000	300.000	225	0	90103.000	450.000
226	0	90103.000	600.000	227	0	90103.000	750.000	228	0	90103.000	900.000
229	0	90103.000	1050.000	230	0	90103.000	1200.000	231	0	90103.000	1350.000
232	0	90103.000	1500.000	233	0	90103.000	1650.000	234	0	90103.000	1800.000
235	0	90103.000	1950.000	236	0	90103.000	2100.000	237	0	90103.000	2250.000
238	1	90103.000	2400.000	239	0	97034.000	0.0	240	0	97034.000	150.000
241	0	97034.000	300.000	242	0	97034.000	450.000	243	0	97034.000	600.000
244	0	97034.000	750.000	245	0	97034.000	900.000	246	0	97034.000	1050.000
247	0	97034.000	1200.000	248	0	97034.000	1350.000	249	0	97034.000	1500.000
250	0	97034.000	1650.000	251	0	97034.000	1800.000	252	0	97034.000	1950.000
253	0	97034.000	2100.000	254	0	97034.000	2250.000	255	1	97034.000	2400.000
256	0	103965.000	0.0	257	0	103965.000	150.000	258	0	103965.000	300.000
259	0	103965.000	450.000	260	0	103965.000	600.000	261	0	103965.000	750.000
262	0	103965.000	900.000	263	0	103965.000	1050.000	264	0	103965.000	1200.000
265	0	103965.000	1350.000	266	0	103965.000	1500.000	267	0	103965.000	1650.000
268	0	103965.000	1800.000	269	0	103965.000	1950.000	270	0	103965.000	2100.000
271	0	103965.000	2250.000	272	1	103965.000	2400.000	273	0	110896.000	0.0
274	0	110896.000	150.000	275	0	110896.000	300.000	276	0	110896.000	450.000
277	0	110896.000	600.000	278	0	110896.000	750.000	279	0	110896.000	900.000
280	0	110896.000	1050.000	281	0	110896.000	1200.000	282	0	110896.000	1350.000
283	0	110896.000	1500.000	284	0	110896.000	1650.000	285	0	110896.000	1800.000
286	0	110896.000	1950.000	287	0	110896.000	2100.000	288	0	110896.000	2250.000
289	1	110896.000	2400.000	290	0	117827.000	0.0	291	0	117827.000	150.000
292	0	117827.000	300.000	293	0	117827.000	450.000	294	0	117827.000	600.000
295	0	117827.000	750.000	296	0	117827.000	900.000	297	0	117827.000	1050.000
298	0	117827.000	1200.000	299	0	117827.000	1350.000	300	0	117827.000	1500.000
301	0	117827.000	1650.000	302	0	117827.000	1800.000	303	0	117827.000	1950.000
304	0	117827.000	2100.000	305	0	117827.000	2250.000	306	1	117827.000	2400.000
307	0	124758.000	0.0	308	0	124758.000	150.000	309	0	124758.000	300.000
310	0	124758.000	450.000	311	0	124758.000	600.000	312	0	124758.000	750.000
313	0	124758.000	900.000	314	0	124758.000	1050.000	315	0	124758.000	1200.000
316	0	124758.000	1350.000	317	0	124758.000	1500.000	318	0	124758.000	1650.000
319	0	124758.000	1800.000	320	0	124758.000	1950.000	321	0	124758.000	2100.000
322	0	124758.000	2250.000	323	1	124758.000	2400.000	324	0	131689.000	0.0
325	0	131689.000	150.000	326	0	131689.000	300.000	327	0	131689.000	450.000

328	0	131689.000	600.000
331	0	131689.000	1050.000
334	0	131689.000	1500.000
337	0	131689.000	1950.000
340	1	131689.000	2400.000
343	0	138620.000	300.000
346	0	138620.000	750.000
349	0	138620.000	1200.000
352	0	138620.000	1650.000
355	0	138620.000	2100.000
358	0	145551.000	0.0
361	0	145551.000	450.000
364	0	145551.000	900.000
367	0	145551.000	1350.000
370	0	145551.000	1800.000
373	0	145551.000	2250.000
376	0	152482.000	150.000
379	0	152482.000	600.000
382	0	152482.000	1050.000
385	0	152482.000	1500.000
388	0	152482.000	1950.000
391	1	152482.000	2400.000
394	0	159413.000	300.000
397	0	159413.000	750.000
400	0	159413.000	1200.000
403	0	159413.000	1650.000
406	0	159413.000	2100.000
409	0	166344.000	0.0
412	0	166344.000	450.000
415	0	166344.000	900.000
418	0	166344.000	1350.000
421	0	166344.000	1800.000
424	0	166344.000	2250.000
427	0	173275.000	150.000
430	0	173275.000	600.000
433	0	173275.000	1050.000
436	0	173275.000	1500.000
439	0	173275.000	1950.000
442	0	173275.000	2400.000
445	0	180206.000	300.000
448	0	180206.000	750.000
451	0	180206.000	1200.000
454	0	180206.000	1650.000
457	0	180206.000	2100.000
460	0	187137.000	0.0
463	0	187137.000	450.000
466	0	187137.000	900.000
469	0	187137.000	1350.000
472	0	187137.000	1800.000
475	0	187137.000	2250.000
478	0	194068.000	150.000
481	0	194068.000	600.000
484	0	194068.000	1050.000
487	0	194068.000	1500.000
490	0	194068.000	1950.000
493	0	194068.000	2400.000
496	0	200999.000	300.000

329	0	131689.000	750.000
332	0	131689.000	1200.000
335	0	131689.000	1650.000
338	0	131689.000	2100.000
341	0	138620.000	0.0
344	0	138620.000	450.000
347	0	138620.000	900.000
350	0	138620.000	1350.000
353	0	138620.000	1800.000
356	0	138620.000	2250.000
359	0	145551.000	150.000
362	0	145551.000	600.000
365	0	145551.000	1050.000
368	0	145551.000	1500.000
371	0	145551.000	1950.000
374	1	145551.000	2400.000
377	0	152482.000	300.000
380	0	152482.000	750.000
383	0	152482.000	1200.000
386	0	152482.000	1650.000
389	0	152482.000	2100.000
392	0	159413.000	0.0
395	0	159413.000	450.000
398	0	159413.000	900.000
401	0	159413.000	1350.000
404	0	159413.000	1800.000
407	0	159413.000	2250.000
410	0	166344.000	150.000
413	0	166344.000	600.000
416	0	166344.000	1050.000
419	0	166344.000	1500.000
422	0	166344.000	1950.000
425	0	166344.000	2400.000
428	0	173275.000	300.000
431	0	173275.000	750.000
434	0	173275.000	1200.000
437	0	173275.000	1650.000
440	0	173275.000	2100.000
443	0	180206.000	0.0
446	0	180206.000	450.000
449	0	180206.000	900.000
452	0	180206.000	1350.000
455	0	180206.000	1800.000
458	0	180206.000	2250.000
461	0	187137.000	150.000
464	0	187137.000	600.000
467	0	187137.000	1050.000
470	0	187137.000	1500.000
473	0	187137.000	1950.000
476	0	187137.000	2400.000
479	0	194068.000	300.000
482	0	194068.000	750.000
485	0	194068.000	1200.000
488	0	194068.000	1650.000
491	0	194068.000	2100.000
494	0	200999.000	0.0
497	0	200999.000	450.000

330	0	131689.000	900.000
333	0	131689.000	1350.000
336	0	131689.000	1800.000
339	0	131689.000	2250.000
342	0	138620.000	150.000
345	0	138620.000	600.000
348	0	138620.000	1050.000
351	0	138620.000	1500.000
354	0	138620.000	1950.000
357	1	138620.000	2400.000
360	0	145551.000	300.000
363	0	145551.000	750.000
366	0	145551.000	1200.000
369	0	145551.000	1650.000
372	0	145551.000	2100.000
375	0	152482.000	0.0
378	0	152482.000	450.000
381	0	152482.000	900.000
384	0	152482.000	1350.000
387	0	152482.000	1800.000
390	0	152482.000	2250.000
393	0	159413.000	150.000
396	0	159413.000	600.000
399	0	159413.000	1050.000
402	0	159413.000	1500.000
405	0	159413.000	1950.000
408	0	159413.000	2400.000
411	0	166344.000	300.000
414	0	166344.000	750.000
417	0	166344.000	1200.000
420	0	166344.000	1650.000
423	0	166344.000	2100.000
426	0	173275.000	0.0
429	0	173275.000	450.000
432	0	173275.000	900.000
435	0	173275.000	1350.000
438	0	173275.000	1800.000
441	0	173275.000	2250.000
444	0	180206.000	150.000
447	0	180206.000	600.000
450	0	180206.000	1050.000
453	0	180206.000	1500.000
456	0	180206.000	1950.000
459	0	180206.000	2400.000
462	0	187137.000	300.000
465	0	187137.000	750.000
468	0	187137.000	1200.000
471	0	187137.000	1650.000
474	0	187137.000	2100.000
477	0	194068.000	0.0
480	0	194068.000	450.000
483	0	194068.000	900.000
486	0	194068.000	1350.000
489	0	194068.000	1800.000
492	0	194068.000	2250.000
495	0	200999.000	150.000
498	0	200999.000	600.000

499	0	200999.000	750.000	500	0	200999.000	900.000	501	0	200999.000	1050.000
502	0	200999.000	1200.000	503	0	200999.000	1350.000	504	0	200999.000	1500.000
505	0	200999.000	1650.000	506	0	200999.000	1800.000	507	0	200999.000	1950.000
508	0	200999.000	2100.000	509	0	200999.000	2250.000	510	0	200999.000	2400.000
511	0	207930.000	0.0	512	0	207930.000	150.000	513	0	207930.000	300.000
514	0	207930.000	450.000	515	0	207930.000	600.000	516	0	207930.000	750.000
517	0	207930.000	900.000	518	0	207930.000	1050.000	519	0	207930.000	1200.000
520	0	207930.000	1350.000	521	0	207930.000	1500.000	522	0	207930.000	1650.000
523	0	207930.000	1800.000	524	0	207930.000	1950.000	525	0	207930.000	2100.000
526	0	207930.000	2250.000	527	0	207930.000	2400.000	528	0	214861.000	0.0
529	0	214861.000	150.000	530	0	214861.000	300.000	531	0	214861.000	450.000
532	0	214861.000	600.000	533	0	214861.000	750.000	534	0	214861.000	900.000
535	0	214861.000	1050.000	536	0	214861.000	1200.000	537	0	214861.000	1350.000
538	0	214861.000	1500.000	539	0	214861.000	1650.000	540	0	214861.000	1800.000
541	0	214861.000	1950.000	542	0	214861.000	2100.000	543	0	214861.000	2250.000
544	0	214861.000	2400.000	545	0	221792.000	0.0	546	0	221792.000	150.000
547	0	221792.000	300.000	548	0	221792.000	450.000	549	0	221792.000	600.000
550	0	221792.000	750.000	551	0	221792.000	900.000	552	0	221792.000	1050.000
553	0	221792.000	1200.000	554	0	221792.000	1350.000	555	0	221792.000	1500.000
556	0	221792.000	1650.000	557	0	221792.000	1800.000	558	0	221792.000	1950.000
559	0	221792.000	2100.000	560	0	221792.000	2250.000	561	0	221792.000	2400.000
562	0	228723.000	0.0	563	0	228723.000	150.000	564	0	228723.000	300.000
565	0	228723.000	450.000	566	0	228723.000	600.000	567	0	228723.000	750.000
568	0	228723.000	900.000	569	0	228723.000	1050.000	570	0	228723.000	1200.000
571	0	228723.000	1350.000	572	0	228723.000	1500.000	573	0	228723.000	1650.000
574	0	228723.000	1800.000	575	0	228723.000	1950.000	576	0	228723.000	2100.000
577	0	228723.000	2250.000	578	0	228723.000	2400.000	579	0	235654.000	0.0
580	0	235654.000	150.000	581	0	235654.000	300.000	582	0	235654.000	450.000
583	0	235654.000	600.000	584	0	235654.000	750.000	585	0	235654.000	900.000
586	0	235654.000	1050.000	587	0	235654.000	1200.000	588	0	235654.000	1350.000
589	0	235654.000	1500.000	590	0	235654.000	1650.000	591	0	235654.000	1800.000
592	0	235654.000	1950.000	593	0	235654.000	2100.000	594	0	235654.000	2250.000
595	0	235654.000	2400.000	596	0	242585.000	0.0	597	0	242585.000	150.000
598	0	242585.000	300.000	599	0	242585.000	450.000	600	0	242585.000	600.000
601	0	242585.000	750.000	602	0	242585.000	900.000	603	0	242585.000	1050.000
604	0	242585.000	1200.000	605	0	242585.000	1350.000	606	0	242585.000	1500.000
607	0	242585.000	1650.000	608	0	242585.000	1800.000	609	0	242585.000	1950.000
610	0	242585.000	2100.000	611	0	242585.000	2250.000	612	0	242585.000	2400.000
613	0	249516.000	0.0	614	0	249516.000	150.000	615	0	249516.000	300.000
616	0	249516.000	450.000	617	0	249516.000	600.000	618	0	249516.000	750.000
619	0	249516.000	900.000	620	0	249516.000	1050.000	621	0	249516.000	1200.000
622	0	249516.000	1350.000	623	0	249516.000	1500.000	624	0	249516.000	1650.000
625	0	249516.000	1800.000	626	0	249516.000	1950.000	627	0	249516.000	2100.000
628	0	249516.000	2250.000	629	0	249516.000	2400.000	630	0	256447.000	0.0
631	0	256447.000	150.000	632	0	256447.000	300.000	633	0	256447.000	450.000
634	0	256447.000	600.000	635	0	256447.000	750.000	636	0	256447.000	900.000
637	0	256447.000	1050.000	638	0	256447.000	1200.000	639	0	256447.000	1350.000
640	0	256447.000	1500.000	641	0	256447.000	1650.000	642	0	256447.000	1800.000
643	0	256447.000	1950.000	644	0	256447.000	2100.000	645	0	256447.000	2250.000
646	0	256447.000	2400.000	647	0	263378.000	0.0	648	0	263378.000	150.000
649	0	263378.000	300.000	650	0	263378.000	450.000	651	0	263378.000	600.000
652	0	263378.000	750.000	653	0	263378.000	900.000	654	0	263378.000	1050.000
655	0	263378.000	1200.000	656	0	263378.000	1350.000	657	0	263378.000	1500.000
658	0	263378.000	1650.000	659	0	263378.000	1800.000	660	0	263378.000	1950.000
661	0	263378.000	2100.000	662	0	263378.000	2250.000	663	0	263378.000	2400.000
664	0	270309.000	0.0	665	0	270309.000	150.000	666	0	270309.000	300.000
667	0	270309.000	450.000	668	0	270309.000	600.000	669	0	270309.000	750.000

670	0	270309.000	900.000	671	0	270309.000	1050.000	672	0	270309.000	1200.000
673	0	270309.000	1350.000	674	0	270309.000	1500.000	675	0	270309.000	1650.000
676	0	270309.000	1800.000	677	0	270309.000	1950.000	678	0	270309.000	2100.000
679	0	270309.000	2250.000	680	0	270309.000	2400.000	681	0	277240.000	0.0
682	0	277240.000	150.000	683	0	277240.000	300.000	684	0	277240.000	450.000
685	0	277240.000	600.000	686	0	277240.000	750.000	687	0	277240.000	900.000
688	0	277240.000	1050.000	689	0	277240.000	1200.000	690	0	277240.000	1350.000
691	0	277240.000	1500.000	692	0	277240.000	1650.000	693	0	277240.000	1800.000
694	0	277240.000	1950.000	695	0	277240.000	2100.000	696	0	277240.000	2250.000
697	0	277240.000	2400.000	698	0	284171.000	0.0	699	0	284171.000	150.000
700	0	284171.000	300.000	701	0	284171.000	450.000	702	0	284171.000	600.000
703	0	284171.000	750.000	704	0	284171.000	900.000	705	0	284171.000	1050.000
706	0	284171.000	1200.000	707	0	284171.000	1350.000	708	0	284171.000	1500.000
709	0	284171.000	1650.000	710	0	284171.000	1800.000	711	0	284171.000	1950.000
712	0	284171.000	2100.000	713	0	284171.000	2250.000	714	0	284171.000	2400.000
715	0	291102.000	0.0	716	0	291102.000	150.000	717	0	291102.000	300.000
718	0	291102.000	450.000	719	0	291102.000	600.000	720	0	291102.000	750.000
721	0	291102.000	900.000	722	0	291102.000	1050.000	723	0	291102.000	1200.000
724	0	291102.000	1350.000	725	0	291102.000	1500.000	726	0	291102.000	1650.000
727	0	291102.000	1800.000	728	0	291102.000	1950.000	729	0	291102.000	2100.000
730	0	291102.000	2250.000	731	0	291102.000	2400.000	732	0	298033.000	0.0
733	0	298033.000	150.000	734	0	298033.000	300.000	735	0	298033.000	450.000
736	0	298033.000	600.000	737	0	298033.000	750.000	738	0	298033.000	900.000
739	0	298033.000	1050.000	740	0	298033.000	1200.000	741	0	298033.000	1350.000
742	0	298033.000	1500.000	743	0	298033.000	1650.000	744	0	298033.000	1800.000
745	0	298033.000	1950.000	746	0	298033.000	2100.000	747	0	298033.000	2250.000
748	0	298033.000	2400.000	749	0	304964.000	0.0	750	0	304964.000	150.000
751	0	304964.000	300.000	752	0	304964.000	450.000	753	0	304964.000	600.000
754	0	304964.000	750.000	755	0	304964.000	900.000	756	0	304964.000	1050.000
757	0	304964.000	1200.000	758	0	304964.000	1350.000	759	0	304964.000	1500.000
760	0	304964.000	1650.000	761	0	304964.000	1800.000	762	0	304964.000	1950.000
763	0	304964.000	2100.000	764	0	304964.000	2250.000	765	1	304964.000	2400.000

ELEMENT INCIDENCES

ELEMENT	INCIDENCES			ELEMENT	INCIDENCES			ELEMENT	INCIDENCES			ELEMENT	INCIDENCES			ELEMENT	INCIDENCES		
1:	1	18	19	2:	1	19	2	3:	2	19	20	4:	2	20	3	5:	3	20	21
6:	3	21	4	7:	4	21	22	8:	4	22	5	9:	5	22	23	10:	5	23	6
11:	6	23	24	12:	6	24	7	13:	7	24	25	14:	7	25	8	15:	8	25	26
16:	8	26	9	17:	9	26	27	18:	9	27	10	19:	10	27	28	20:	10	28	11
21:	11	28	29	22:	11	29	12	23:	12	29	30	24:	12	30	13	25:	13	30	31
26:	13	31	14	27:	14	31	32	28:	14	32	15	29:	15	32	33	30:	15	33	16
31:	16	33	34	32:	16	34	17	33:	18	35	36	34:	18	36	19	35:	19	36	37
36:	19	37	20	37:	20	37	38	38:	20	38	21	39:	21	38	39	40:	21	39	22
41:	22	39	40	42:	22	40	23	43:	23	40	41	44:	23	41	24	45:	24	41	42
46:	24	42	25	47:	25	42	43	48:	25	43	26	49:	26	43	44	50:	26	44	27
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1406:	746	764	747	1407:	747	764	765	1408:	747	765	748								

ELEMENT HYDRAULIC CONDUCTIVITIES

ELEMENT	HYDRAUL. COND. (HORZ.	VERT.)	ANGLE	ELEMENT	HYDRAUL. COND. (HORZ.	VERT.)	ANGLE	ELEMENT	HYDRAUL. COND. (HORZ.	VERT.)	ANGLE
1:	0.1000E-04	0.1000E-05	0.0	2:	0.1000E-04	0.1000E-05	0.0	3:	0.1000E-04	0.1000E-05	0.0
4:	0.1000E-04	0.1000E-05	0.0	5:	0.1000E-04	0.1000E-05	0.0	6:	0.1000E-04	0.1000E-05	0.0
7:	0.1000E-04	0.1000E-05	0.0	8:	0.1000E-04	0.1000E-05	0.0	9:	0.1000E-04	0.1000E-05	0.0
10:	0.1000E-04	0.1000E-05	0.0	11:	0.1000E-04	0.1000E-05	0.0	12:	0.1000E-04	0.1000E-05	0.0
13:	0.1000E-04	0.1000E-05	0.0	14:	0.1000E-04	0.1000E-05	0.0	15:	0.1000E-04	0.1000E-05	0.0
16:	0.1000E-04	0.1000E-05	0.0	17:	0.1000E-04	0.1000E-05	0.0	18:	0.1000E-04	0.1000E-05	0.0
19:	0.1000E-04	0.1000E-05	0.0	20:	0.1000E-04	0.1000E-05	0.0	21:	0.1000E-04	0.1000E-05	0.0
22:	0.1000E-04	0.1000E-05	0.0	23:	0.1000E-04	0.1000E-05	0.0	24:	0.1000E-04	0.1000E-05	0.0
25:	0.1000E-04	0.1000E-05	0.0	26:	0.1000E-04	0.1000E-05	0.0	27:	0.1000E-04	0.1000E-05	0.0
28:	0.1000E-04	0.1000E-05	0.0	29:	0.4000E+02	0.7000E+02	0.0	30:	0.4000E+02	0.7000E+02	0.0
31:	0.4000E+02	0.7000E+02	0.0	32:	0.4000E+02	0.7000E+02	0.0	33:	0.1000E-04	0.1000E-05	0.0
34:	0.1000E-04	0.1000E-05	0.0	35:	0.1000E-04	0.1000E-05	0.0	36:	0.1000E-04	0.1000E-05	0.0
37:	0.1000E-04	0.1000E-05	0.0	38:	0.1000E-04	0.1000E-05	0.0	39:	0.1000E-04	0.1000E-05	0.0
40:	0.1000E-04	0.1000E-05	0.0	41:	0.1000E-04	0.1000E-05	0.0	42:	0.1000E-04	0.1000E-05	0.0
43:	0.1000E-04	0.1000E-05	0.0	44:	0.1000E-04	0.1000E-05	0.0	45:	0.1000E-04	0.1000E-05	0.0
46:	0.1000E-04	0.1000E-05	0.0	47:	0.1000E-04	0.1000E-05	0.0	48:	0.1000E-04	0.1000E-05	0.0
49:	0.1000E-04	0.1000E-05	0.0	50:	0.1000E-04	0.1000E-05	0.0	51:	0.1000E-04	0.1000E-05	0.0
52:	0.1000E-04	0.1000E-05	0.0	53:	0.1000E-04	0.1000E-05	0.0	54:	0.1000E-04	0.1000E-05	0.0
55:	0.1000E-04	0.1000E-05	0.0	56:	0.1000E-04	0.1000E-05	0.0	57:	0.4000E+02	0.7000E+02	0.0
58:	0.4000E+02	0.7000E+02	0.0	59:	0.4000E+02	0.7000E+02	0.0	60:	0.4000E+02	0.7000E+02	0.0
61:	0.4000E+02	0.7000E+02	0.0	62:	0.4000E+02	0.7000E+02	0.0	63:	0.4000E+02	0.7000E+02	0.0
64:	0.4000E+02	0.7000E+02	0.0	65:	0.1000E-04	0.1000E-05	0.0	66:	0.1000E-04	0.1000E-05	0.0
67:	0.1000E-04	0.1000E-05	0.0	68:	0.1000E-04	0.1000E-05	0.0	69:	0.1000E-04	0.1000E-05	0.0
70:	0.1000E-04	0.1000E-05	0.0	71:	0.1000E-04	0.1000E-05	0.0	72:	0.1000E-04	0.1000E-05	0.0
73:	0.1000E-04	0.1000E-05	0.0	74:	0.1000E-04	0.1000E-05	0.0	75:	0.1000E-04	0.1000E-05	0.0
76:	0.1000E-04	0.1000E-05	0.0	77:	0.1000E-04	0.1000E-05	0.0	78:	0.1000E-04	0.1000E-05	0.0
79:	0.1000E-04	0.1000E-05	0.0	80:	0.1000E-04	0.1000E-05	0.0	81:	0.1000E-04	0.1000E-05	0.0
82:	0.1000E-04	0.1000E-05	0.0	83:	0.1000E-04	0.1000E-05	0.0	84:	0.1000E-04	0.1000E-05	0.0
85:	0.4000E+02	0.7000E+02	0.0	86:	0.4000E+02	0.7000E+02	0.0	87:	0.4000E+02	0.7000E+02	0.0
88:	0.4000E+02	0.7000E+02	0.0	89:	0.4000E+02	0.7000E+02	0.0	90:	0.4000E+02	0.7000E+02	0.0
91:	0.4000E+02	0.7000E+02	0.0	92:	0.4000E+02	0.7000E+02	0.0	93:	0.5000E+02	0.1400E+01	0.0
94:	0.5000E+02	0.1400E+01	0.0	95:	0.5000E+02	0.1400E+01	0.0	96:	0.5000E+02	0.1400E+01	0.0
97:	0.1000E-04	0.1000E-05	0.0	98:	0.1000E-04	0.1000E-05	0.0	99:	0.1000E-04	0.1000E-05	0.0
100:	0.1000E-04	0.1000E-05	0.0	101:	0.1000E-04	0.1000E-05	0.0	102:	0.1000E-04	0.1000E-05	0.0
103:	0.1000E-04	0.1000E-05	0.0	104:	0.1000E-04	0.1000E-05	0.0	105:	0.1000E-04	0.1000E-05	0.0
106:	0.1000E-04	0.1000E-05	0.0	107:	0.1000E-04	0.1000E-05	0.0	108:	0.1000E-04	0.1000E-05	0.0
109:	0.1000E-04	0.1000E-05	0.0	110:	0.1000E-04	0.1000E-05	0.0	111:	0.1000E-04	0.1000E-05	0.0
112:	0.1000E-04	0.1000E-05	0.0	113:	0.4000E+02	0.7000E+02	0.0	114:	0.4000E+02	0.7000E+02	0.0
115:	0.4000E+02	0.7000E+02	0.0	116:	0.4000E+02	0.7000E+02	0.0	117:	0.4000E+02	0.7000E+02	0.0
118:	0.4000E+02	0.7000E+02	0.0	119:	0.4000E+02	0.7000E+02	0.0	120:	0.4000E+02	0.7000E+02	0.0
121:	0.1000E-01	0.1000E-02	0.0	122:	0.1000E-01	0.1000E-02	0.0	123:	0.1000E-01	0.1000E-02	0.0
124:	0.1000E-01	0.1000E-02	0.0	125:	0.5000E+02	0.1400E+01	0.0	126:	0.5000E+02	0.1400E+01	0.0
127:	0.5000E+02	0.1400E+01	0.0	128:	0.5000E+02	0.1400E+01	0.0	129:	0.1000E-04	0.1000E-05	0.0
130:	0.1000E-04	0.1000E-05	0.0	131:	0.1000E-04	0.1000E-05	0.0	132:	0.1000E-04	0.1000E-05	0.0
133:	0.1000E-04	0.1000E-05	0.0	134:	0.1000E-04	0.1000E-05	0.0	135:	0.1000E-04	0.1000E-05	0.0
136:	0.1000E-04	0.1000E-05	0.0	137:	0.1000E-04	0.1000E-05	0.0	138:	0.1000E-04	0.1000E-05	0.0
139:	0.1000E-04	0.1000E-05	0.0	140:	0.1000E-04	0.1000E-05	0.0	141:	0.4000E+02	0.7000E+02	0.0
142:	0.4000E+02	0.7000E+02	0.0	143:	0.4000E+02	0.7000E+02	0.0	144:	0.4000E+02	0.7000E+02	0.0
145:	0.4000E+02	0.7000E+02	0.0	146:	0.4000E+02	0.7000E+02	0.0	147:	0.1000E-01	0.1000E-02	0.0
148:	0.1000E-01	0.1000E-02	0.0	149:	0.1000E-01	0.1000E-02	0.0	150:	0.1000E-01	0.1000E-02	0.0

151:	0.1000E-01	0.1000E-02	0.0	152:	0.1000E-01	0.1000E-02	0.0	153:	0.1000E-01	0.1000E-02	0.0
154:	0.1000E-01	0.1000E-02	0.0	155:	0.1000E-01	0.1000E-02	0.0	156:	0.1000E-01	0.1000E-02	0.0
157:	0.5000E+02	0.1400E+01	0.0	158:	0.5000E+02	0.1400E+01	0.0	159:	0.5000E+02	0.1400E+01	0.0
160:	0.5000E+02	0.1400E+01	0.0	161:	0.1000E-04	0.1000E-05	0.0	162:	0.1000E-04	0.1000E-05	0.0
163:	0.1000E-04	0.1000E-05	0.0	164:	0.1000E-04	0.1000E-05	0.0	165:	0.1000E-04	0.1000E-05	0.0
166:	0.1000E-04	0.1000E-05	0.0	167:	0.1000E-04	0.1000E-05	0.0	168:	0.1000E-04	0.1000E-05	0.0
169:	0.4000E+02	0.7000E+02	0.0	170:	0.4000E+02	0.7000E+02	0.0	171:	0.4000E+02	0.7000E+02	0.0
172:	0.4000E+02	0.7000E+02	0.0	173:	0.4000E+02	0.7000E+02	0.0	174:	0.4000E+02	0.7000E+02	0.0
175:	0.4000E+02	0.7000E+02	0.0	176:	0.4000E+02	0.7000E+02	0.0	177:	0.1000E-01	0.1000E-02	0.0
178:	0.1000E-01	0.1000E-02	0.0	179:	0.1000E-01	0.1000E-02	0.0	180:	0.1000E-01	0.1000E-02	0.0
181:	0.1000E-01	0.1000E-02	0.0	182:	0.1000E-01	0.1000E-02	0.0	183:	0.1000E-01	0.1000E-02	0.0
184:	0.1000E-01	0.1000E-02	0.0	185:	0.5000E+02	0.1400E+01	0.0	186:	0.5000E+02	0.1400E+01	0.0
187:	0.5000E+02	0.1400E+01	0.0	188:	0.5000E+02	0.1400E+01	0.0	189:	0.5000E+02	0.1400E+01	0.0
190:	0.5000E+02	0.1400E+01	0.0	191:	0.5000E+02	0.1400E+01	0.0	192:	0.5000E+02	0.1400E+01	0.0
193:	0.1000E-04	0.1000E-05	0.0	194:	0.1000E-04	0.1000E-05	0.0	195:	0.1000E-04	0.1000E-05	0.0
196:	0.1000E-04	0.1000E-05	0.0	197:	0.4000E+02	0.7000E+02	0.0	198:	0.4000E+02	0.7000E+02	0.0
199:	0.4000E+02	0.7000E+02	0.0	200:	0.4000E+02	0.7000E+02	0.0	201:	0.4000E+02	0.7000E+02	0.0
202:	0.4000E+02	0.7000E+02	0.0	203:	0.4000E+02	0.7000E+02	0.0	204:	0.4000E+02	0.7000E+02	0.0
205:	0.1000E-01	0.1000E-02	0.0	206:	0.1000E-01	0.1000E-02	0.0	207:	0.1000E-01	0.1000E-02	0.0
208:	0.1000E-01	0.1000E-02	0.0	209:	0.1000E-01	0.1000E-02	0.0	210:	0.1000E-01	0.1000E-02	0.0
211:	0.1000E-01	0.1000E-02	0.0	212:	0.1000E-01	0.1000E-02	0.0	213:	0.1000E-01	0.1000E-02	0.0
214:	0.1000E-01	0.1000E-02	0.0	215:	0.5000E+02	0.1400E+01	0.0	216:	0.5000E+02	0.1400E+01	0.0
217:	0.5000E+02	0.1400E+01	0.0	218:	0.5000E+02	0.1400E+01	0.0	219:	0.5000E+02	0.1400E+01	0.0
220:	0.5000E+02	0.1400E+01	0.0	221:	0.5000E+02	0.1400E+01	0.0	222:	0.5000E+02	0.1400E+01	0.0
223:	0.5000E+02	0.1400E+01	0.0	224:	0.5000E+02	0.1400E+01	0.0	225:	0.1000E-04	0.1000E-05	0.0
226:	0.1000E-04	0.1000E-05	0.0	227:	0.1000E-04	0.1000E-05	0.0	228:	0.1000E-04	0.1000E-05	0.0
229:	0.4000E+02	0.7000E+02	0.0	230:	0.4000E+02	0.7000E+02	0.0	231:	0.1000E-01	0.1000E-02	0.0
232:	0.1000E-01	0.1000E-02	0.0	233:	0.1000E-01	0.1000E-02	0.0	234:	0.1000E-01	0.1000E-02	0.0
235:	0.1000E-01	0.1000E-02	0.0	236:	0.1000E-01	0.1000E-02	0.0	237:	0.1000E-01	0.1000E-02	0.0
238:	0.1000E-01	0.1000E-02	0.0	239:	0.1000E-01	0.1000E-02	0.0	240:	0.1000E-01	0.1000E-02	0.0
241:	0.1000E-01	0.1000E-02	0.0	242:	0.1000E-01	0.1000E-02	0.0	243:	0.5000E+02	0.1400E+01	0.0
244:	0.5000E+02	0.1400E+01	0.0	245:	0.5000E+02	0.1400E+01	0.0	246:	0.5000E+02	0.1400E+01	0.0
247:	0.5000E+02	0.1400E+01	0.0	248:	0.5000E+02	0.1400E+01	0.0	249:	0.5000E+02	0.1400E+01	0.0
250:	0.5000E+02	0.1400E+01	0.0	251:	0.5000E+02	0.1400E+01	0.0	252:	0.5000E+02	0.1400E+01	0.0
253:	0.5000E+02	0.1400E+01	0.0	254:	0.5000E+02	0.1400E+01	0.0	255:	0.5000E+02	0.1400E+01	0.0
256:	0.5000E+02	0.1400E+01	0.0	257:	0.1000E-04	0.1000E-05	0.0	258:	0.1000E-04	0.1000E-05	0.0
259:	0.1000E-04	0.1000E-05	0.0	260:	0.1000E-04	0.1000E-05	0.0	261:	0.4000E+02	0.7000E+02	0.0
262:	0.4000E+02	0.7000E+02	0.0	263:	0.1000E-01	0.1000E-02	0.0	264:	0.1000E-01	0.1000E-02	0.0
265:	0.1000E-01	0.1000E-02	0.0	266:	0.1000E-01	0.1000E-02	0.0	267:	0.1000E-01	0.1000E-02	0.0
268:	0.1000E-01	0.1000E-02	0.0	269:	0.1000E-01	0.1000E-02	0.0	270:	0.1000E-01	0.1000E-02	0.0
271:	0.1000E-01	0.1000E-02	0.0	272:	0.1000E-01	0.1000E-02	0.0	273:	0.1000E-01	0.1000E-02	0.0
274:	0.1000E-01	0.1000E-02	0.0	275:	0.5000E+02	0.1400E+01	0.0	276:	0.5000E+02	0.1400E+01	0.0
277:	0.5000E+02	0.1400E+01	0.0	278:	0.5000E+02	0.1400E+01	0.0	279:	0.5000E+02	0.1400E+01	0.0
280:	0.5000E+02	0.1400E+01	0.0	281:	0.5000E+02	0.1400E+01	0.0	282:	0.5000E+02	0.1400E+01	0.0
283:	0.5000E+02	0.1400E+01	0.0	284:	0.5000E+02	0.1400E+01	0.0	285:	0.5000E+02	0.1400E+01	0.0
286:	0.5000E+02	0.1400E+01	0.0	287:	0.5000E+02	0.1400E+01	0.0	288:	0.5000E+02	0.1400E+01	0.0
289:	0.4000E+02	0.7000E+02	0.0	290:	0.4000E+02	0.7000E+02	0.0	291:	0.4000E+02	0.7000E+02	0.0
292:	0.4000E+02	0.7000E+02	0.0	293:	0.4000E+02	0.7000E+02	0.0	294:	0.4000E+02	0.7000E+02	0.0
295:	0.1000E-01	0.1000E-02	0.0	296:	0.1000E-01	0.1000E-02	0.0	297:	0.1000E-01	0.1000E-02	0.0
298:	0.1000E-01	0.1000E-02	0.0	299:	0.1000E-01	0.1000E-02	0.0	300:	0.1000E-01	0.1000E-02	0.0
301:	0.1000E-01	0.1000E-02	0.0	302:	0.1000E-01	0.1000E-02	0.0	303:	0.1000E-01	0.1000E-02	0.0
304:	0.1000E-01	0.1000E-02	0.0	305:	0.1000E-01	0.1000E-02	0.0	306:	0.1000E-01	0.1000E-02	0.0
307:	0.5000E+02	0.1400E+01	0.0	308:	0.5000E+02	0.1400E+01	0.0	309:	0.5000E+02	0.1400E+01	0.0
310:	0.5000E+02	0.1400E+01	0.0	311:	0.5000E+02	0.1400E+01	0.0	312:	0.5000E+02	0.1400E+01	0.0
313:	0.5000E+02	0.1400E+01	0.0	314:	0.5000E+02	0.1400E+01	0.0	315:	0.5000E+02	0.1400E+01	0.0
316:	0.5000E+02	0.1400E+01	0.0	317:	0.5000E+02	0.1400E+01	0.0	318:	0.5000E+02	0.1400E+01	0.0
319:	0.5000E+02	0.1400E+01	0.0	320:	0.5000E+02	0.1400E+01	0.0	321:	0.4000E+02	0.7000E+02	0.0

322:	0.4000E+02	0.7000E+02	0.0
325:	0.1000E-01	0.1000E-02	0.0
328:	0.1000E-01	0.1000E-02	0.0
331:	0.1000E-04	0.1000E-05	0.0
334:	0.1000E-04	0.1000E-05	0.0
337:	0.1000E-01	0.1000E-02	0.0
340:	0.5000E+02	0.1400E+01	0.0
343:	0.5000E+02	0.1400E+01	0.0
346:	0.5000E+02	0.1400E+01	0.0
349:	0.5000E+02	0.1400E+01	0.0
352:	0.5000E+02	0.1400E+01	0.0
355:	0.4000E+02	0.7000E+02	0.0
358:	0.1000E-01	0.1000E-02	0.0
361:	0.1000E-01	0.1000E-02	0.0
364:	0.1000E-04	0.1000E-05	0.0
367:	0.1000E-04	0.1000E-05	0.0
370:	0.1000E-01	0.1000E-02	0.0
373:	0.5000E+02	0.1400E+01	0.0
376:	0.5000E+02	0.1400E+01	0.0
379:	0.5000E+02	0.1400E+01	0.0
382:	0.5000E+02	0.1400E+01	0.0
385:	0.4000E+02	0.7000E+02	0.0
388:	0.4000E+02	0.7000E+02	0.0
391:	0.1000E-04	0.1000E-05	0.0
394:	0.1000E-04	0.1000E-05	0.0
397:	0.1000E-04	0.1000E-05	0.0
400:	0.1000E-04	0.1000E-05	0.0
403:	0.5000E+02	0.1400E+01	0.0
406:	0.5000E+02	0.1400E+01	0.0
409:	0.5000E+02	0.1400E+01	0.0
412:	0.5000E+02	0.1400E+01	0.0
415:	0.5000E+02	0.1400E+01	0.0
418:	0.4000E+02	0.7000E+02	0.0
421:	0.1000E-01	0.1000E-02	0.0
424:	0.1000E-04	0.1000E-05	0.0
427:	0.1000E-04	0.1000E-05	0.0
430:	0.1000E-04	0.1000E-05	0.0
433:	0.1000E-01	0.1000E-02	0.0
436:	0.5000E+02	0.1400E+01	0.0
439:	0.5000E+02	0.1400E+01	0.0
442:	0.5000E+02	0.1400E+01	0.0
445:	0.5000E+02	0.1400E+01	0.0
448:	0.5000E+02	0.1400E+01	0.0
451:	0.4000E+02	0.7000E+02	0.0
454:	0.1000E-01	0.1000E-02	0.0
457:	0.1000E-04	0.1000E-05	0.0
460:	0.1000E-04	0.1000E-05	0.0
463:	0.1000E-04	0.1000E-05	0.0
466:	0.1000E-01	0.1000E-02	0.0
469:	0.5000E+02	0.1400E+01	0.0
472:	0.5000E+02	0.1400E+01	0.0
475:	0.5000E+02	0.1400E+01	0.0
478:	0.5000E+02	0.1400E+01	0.0
481:	0.4000E+02	0.7000E+02	0.0
484:	0.4000E+02	0.7000E+02	0.0
487:	0.1000E-04	0.1000E-05	0.0
490:	0.1000E-04	0.1000E-05	0.0

323:	0.4000E+02	0.7000E+02	0.0
326:	0.1000E-01	0.1000E-02	0.0
329:	0.1000E-01	0.1000E-02	0.0
332:	0.1000E-04	0.1000E-05	0.0
335:	0.1000E-04	0.1000E-05	0.0
338:	0.1000E-01	0.1000E-02	0.0
341:	0.5000E+02	0.1400E+01	0.0
344:	0.5000E+02	0.1400E+01	0.0
347:	0.5000E+02	0.1400E+01	0.0
350:	0.5000E+02	0.1400E+01	0.0
353:	0.4000E+02	0.7000E+02	0.0
356:	0.4000E+02	0.7000E+02	0.0
359:	0.1000E-01	0.1000E-02	0.0
362:	0.1000E-01	0.1000E-02	0.0
365:	0.1000E-04	0.1000E-05	0.0
368:	0.1000E-04	0.1000E-05	0.0
371:	0.5000E+02	0.1400E+01	0.0
374:	0.5000E+02	0.1400E+01	0.0
377:	0.5000E+02	0.1400E+01	0.0
380:	0.5000E+02	0.1400E+01	0.0
383:	0.5000E+02	0.1400E+01	0.0
386:	0.4000E+02	0.7000E+02	0.0
389:	0.1000E-01	0.1000E-02	0.0
392:	0.1000E-04	0.1000E-05	0.0
395:	0.1000E-04	0.1000E-05	0.0
398:	0.1000E-04	0.1000E-05	0.0
401:	0.1000E-01	0.1000E-02	0.0
404:	0.5000E+02	0.1400E+01	0.0
407:	0.5000E+02	0.1400E+01	0.0
410:	0.5000E+02	0.1400E+01	0.0
413:	0.5000E+02	0.1400E+01	0.0
416:	0.5000E+02	0.1400E+01	0.0
419:	0.4000E+02	0.7000E+02	0.0
422:	0.1000E-01	0.1000E-02	0.0
425:	0.1000E-04	0.1000E-05	0.0
428:	0.1000E-04	0.1000E-05	0.0
431:	0.1000E-04	0.1000E-05	0.0
434:	0.1000E-01	0.1000E-02	0.0
437:	0.5000E+02	0.1400E+01	0.0
440:	0.5000E+02	0.1400E+01	0.0
443:	0.5000E+02	0.1400E+01	0.0
446:	0.5000E+02	0.1400E+01	0.0
449:	0.4000E+02	0.7000E+02	0.0
452:	0.4000E+02	0.7000E+02	0.0
455:	0.1000E-04	0.1000E-05	0.0
458:	0.1000E-04	0.1000E-05	0.0
461:	0.1000E-04	0.1000E-05	0.0
464:	0.1000E-04	0.1000E-05	0.0
467:	0.5000E+02	0.1400E+01	0.0
470:	0.5000E+02	0.1400E+01	0.0
473:	0.5000E+02	0.1400E+01	0.0
476:	0.5000E+02	0.1400E+01	0.0
479:	0.5000E+02	0.1400E+01	0.0
482:	0.4000E+02	0.7000E+02	0.0
485:	0.1000E-01	0.1000E-02	0.0
488:	0.1000E-04	0.1000E-05	0.0
491:	0.1000E-04	0.1000E-05	0.0

324:	0.4000E+02	0.7000E+02	0.0
327:	0.1000E-01	0.1000E-02	0.0
330:	0.1000E-01	0.1000E-02	0.0
333:	0.1000E-04	0.1000E-05	0.0
336:	0.1000E-04	0.1000E-05	0.0
339:	0.5000E+02	0.1400E+01	0.0
342:	0.5000E+02	0.1400E+01	0.0
345:	0.5000E+02	0.1400E+01	0.0
348:	0.5000E+02	0.1400E+01	0.0
351:	0.5000E+02	0.1400E+01	0.0
354:	0.4000E+02	0.7000E+02	0.0
357:	0.1000E-01	0.1000E-02	0.0
360:	0.1000E-01	0.1000E-02	0.0
363:	0.1000E-04	0.1000E-05	0.0
366:	0.1000E-04	0.1000E-05	0.0
369:	0.1000E-01	0.1000E-02	0.0
372:	0.5000E+02	0.1400E+01	0.0
375:	0.5000E+02	0.1400E+01	0.0
378:	0.5000E+02	0.1400E+01	0.0
381:	0.5000E+02	0.1400E+01	0.0
384:	0.5000E+02	0.1400E+01	0.0
387:	0.4000E+02	0.7000E+02	0.0
390:	0.1000E-01	0.1000E-02	0.0
393:	0.1000E-04	0.1000E-05	0.0
396:	0.1000E-04	0.1000E-05	0.0
399:	0.1000E-04	0.1000E-05	0.0
402:	0.1000E-01	0.1000E-02	0.0
405:	0.5000E+02	0.1400E+01	0.0
408:	0.5000E+02	0.1400E+01	0.0
411:	0.5000E+02	0.1400E+01	0.0
414:	0.5000E+02	0.1400E+01	0.0
417:	0.4000E+02	0.7000E+02	0.0
420:	0.4000E+02	0.7000E+02	0.0
423:	0.1000E-04	0.1000E-05	0.0
426:	0.1000E-04	0.1000E-05	0.0
429:	0.1000E-04	0.1000E-05	0.0
432:	0.1000E-04	0.1000E-05	0.0
435:	0.5000E+02	0.1400E+01	0.0
438:	0.5000E+02	0.1400E+01	0.0
441:	0.5000E+02	0.1400E+01	0.0
444:	0.5000E+02	0.1400E+01	0.0
447:	0.5000E+02	0.1400E+01	0.0
450:	0.4000E+02	0.7000E+02	0.0
453:	0.1000E-01	0.1000E-02	0.0
456:	0.1000E-04	0.1000E-05	0.0
459:	0.1000E-04	0.1000E-05	0.0
462:	0.1000E-04	0.1000E-05	0.0
465:	0.1000E-01	0.1000E-02	0.0
468:	0.5000E+02	0.1400E+01	0.0
471:	0.5000E+02	0.1400E+01	0.0
474:	0.5000E+02	0.1400E+01	0.0
477:	0.5000E+02	0.1400E+01	0.0
480:	0.5000E+02	0.1400E+01	0.0
483:	0.4000E+02	0.7000E+02	0.0
486:	0.1000E-01	0.1000E-02	0.0
489:	0.1000E-04	0.1000E-05	0.0
492:	0.1000E-04	0.1000E-05	0.0

493:	0.1000E-04	0.1000E-05	0.0
496:	0.1000E-04	0.1000E-05	0.0
499:	0.5000E+02	0.1400E+01	0.0
502:	0.5000E+02	0.1400E+01	0.0
505:	0.5000E+02	0.1400E+01	0.0
508:	0.5000E+02	0.1400E+01	0.0
511:	0.5000E+02	0.1400E+01	0.0
514:	0.4000E+02	0.7000E+02	0.0
517:	0.1000E-01	0.1000E-02	0.0
520:	0.1000E-04	0.1000E-05	0.0
523:	0.1000E-04	0.1000E-05	0.0
526:	0.1000E-04	0.1000E-05	0.0
529:	0.1000E-01	0.1000E-02	0.0
532:	0.5000E+02	0.1400E+01	0.0
535:	0.5000E+02	0.1400E+01	0.0
538:	0.5000E+02	0.1400E+01	0.0
541:	0.5000E+02	0.1400E+01	0.0
544:	0.5000E+02	0.1400E+01	0.0
547:	0.4000E+02	0.7000E+02	0.0
550:	0.1000E-01	0.1000E-02	0.0
553:	0.1000E-04	0.1000E-05	0.0
556:	0.1000E-04	0.1000E-05	0.0
559:	0.1000E-04	0.1000E-05	0.0
562:	0.1000E-01	0.1000E-02	0.0
565:	0.5000E+02	0.1400E+01	0.0
568:	0.5000E+02	0.1400E+01	0.0
571:	0.5000E+02	0.1400E+01	0.0
574:	0.5000E+02	0.1400E+01	0.0
577:	0.4000E+02	0.7000E+02	0.0
580:	0.4000E+02	0.7000E+02	0.0
583:	0.1000E-04	0.1000E-05	0.0
586:	0.1000E-04	0.1000E-05	0.0
589:	0.1000E-04	0.1000E-05	0.0
592:	0.1000E-04	0.1000E-05	0.0
595:	0.5000E+02	0.1400E+01	0.0
598:	0.5000E+02	0.1400E+01	0.0
601:	0.5000E+02	0.1400E+01	0.0
604:	0.5000E+02	0.1400E+01	0.0
607:	0.5000E+02	0.1400E+01	0.0
610:	0.4000E+02	0.7000E+02	0.0
613:	0.1000E-01	0.1000E-02	0.0
616:	0.1000E-04	0.1000E-05	0.0
619:	0.1000E-04	0.1000E-05	0.0
622:	0.1000E-04	0.1000E-05	0.0
625:	0.1000E-01	0.1000E-02	0.0
628:	0.5000E+02	0.1400E+01	0.0
631:	0.5000E+02	0.1400E+01	0.0
634:	0.5000E+02	0.1400E+01	0.0
637:	0.5000E+02	0.1400E+01	0.0
640:	0.5000E+02	0.1400E+01	0.0
643:	0.4000E+02	0.7000E+02	0.0
646:	0.1000E-01	0.1000E-02	0.0
649:	0.1000E-04	0.1000E-05	0.0
652:	0.1000E-04	0.1000E-05	0.0
655:	0.1000E-04	0.1000E-05	0.0
658:	0.1000E-01	0.1000E-02	0.0
661:	0.5000E+02	0.1400E+01	0.0

494:	0.1000E-04	0.1000E-05	0.0
497:	0.1000E-01	0.1000E-02	0.0
500:	0.5000E+02	0.1400E+01	0.0
503:	0.5000E+02	0.1400E+01	0.0
506:	0.5000E+02	0.1400E+01	0.0
509:	0.5000E+02	0.1400E+01	0.0
512:	0.5000E+02	0.1400E+01	0.0
515:	0.4000E+02	0.7000E+02	0.0
518:	0.1000E-01	0.1000E-02	0.0
521:	0.1000E-04	0.1000E-05	0.0
524:	0.1000E-04	0.1000E-05	0.0
527:	0.1000E-04	0.1000E-05	0.0
530:	0.1000E-01	0.1000E-02	0.0
533:	0.5000E+02	0.1400E+01	0.0
536:	0.5000E+02	0.1400E+01	0.0
539:	0.5000E+02	0.1400E+01	0.0
542:	0.5000E+02	0.1400E+01	0.0
545:	0.4000E+02	0.7000E+02	0.0
548:	0.4000E+02	0.7000E+02	0.0
551:	0.1000E-04	0.1000E-05	0.0
554:	0.1000E-04	0.1000E-05	0.0
557:	0.1000E-04	0.1000E-05	0.0
560:	0.1000E-04	0.1000E-05	0.0
563:	0.5000E+02	0.1400E+01	0.0
566:	0.5000E+02	0.1400E+01	0.0
569:	0.5000E+02	0.1400E+01	0.0
572:	0.5000E+02	0.1400E+01	0.0
575:	0.5000E+02	0.1400E+01	0.0
578:	0.4000E+02	0.7000E+02	0.0
581:	0.1000E-01	0.1000E-02	0.0
584:	0.1000E-04	0.1000E-05	0.0
587:	0.1000E-04	0.1000E-05	0.0
590:	0.1000E-04	0.1000E-05	0.0
593:	0.1000E-01	0.1000E-02	0.0
596:	0.5000E+02	0.1400E+01	0.0
599:	0.5000E+02	0.1400E+01	0.0
602:	0.5000E+02	0.1400E+01	0.0
605:	0.5000E+02	0.1400E+01	0.0
608:	0.5000E+02	0.1400E+01	0.0
611:	0.4000E+02	0.7000E+02	0.0
614:	0.1000E-01	0.1000E-02	0.0
617:	0.1000E-04	0.1000E-05	0.0
620:	0.1000E-04	0.1000E-05	0.0
623:	0.1000E-04	0.1000E-05	0.0
626:	0.1000E-01	0.1000E-02	0.0
629:	0.5000E+02	0.1400E+01	0.0
632:	0.5000E+02	0.1400E+01	0.0
635:	0.5000E+02	0.1400E+01	0.0
638:	0.5000E+02	0.1400E+01	0.0
641:	0.4000E+02	0.7000E+02	0.0
644:	0.4000E+02	0.7000E+02	0.0
647:	0.1000E-04	0.1000E-05	0.0
650:	0.1000E-04	0.1000E-05	0.0
653:	0.1000E-04	0.1000E-05	0.0
656:	0.1000E-04	0.1000E-05	0.0
659:	0.5000E+02	0.1400E+01	0.0
662:	0.5000E+02	0.1400E+01	0.0

495:	0.1000E-04	0.1000E-05	0.0
498:	0.1000E-01	0.1000E-02	0.0
501:	0.5000E+02	0.1400E+01	0.0
504:	0.5000E+02	0.1400E+01	0.0
507:	0.5000E+02	0.1400E+01	0.0
510:	0.5000E+02	0.1400E+01	0.0
513:	0.4000E+02	0.7000E+02	0.0
516:	0.4000E+02	0.7000E+02	0.0
519:	0.1000E-04	0.1000E-05	0.0
522:	0.1000E-04	0.1000E-05	0.0
525:	0.1000E-04	0.1000E-05	0.0
528:	0.1000E-04	0.1000E-05	0.0
531:	0.5000E+02	0.1400E+01	0.0
534:	0.5000E+02	0.1400E+01	0.0
537:	0.5000E+02	0.1400E+01	0.0
540:	0.5000E+02	0.1400E+01	0.0
543:	0.5000E+02	0.1400E+01	0.0
546:	0.4000E+02	0.7000E+02	0.0
549:	0.1000E-01	0.1000E-02	0.0
552:	0.1000E-04	0.1000E-05	0.0
555:	0.1000E-04	0.1000E-05	0.0
558:	0.1000E-04	0.1000E-05	0.0
561:	0.1000E-01	0.1000E-02	0.0
564:	0.5000E+02	0.1400E+01	0.0
567:	0.5000E+02	0.1400E+01	0.0
570:	0.5000E+02	0.1400E+01	0.0
573:	0.5000E+02	0.1400E+01	0.0
576:	0.5000E+02	0.1400E+01	0.0
579:	0.4000E+02	0.7000E+02	0.0
582:	0.1000E-01	0.1000E-02	0.0
585:	0.1000E-04	0.1000E-05	0.0
588:	0.1000E-04	0.1000E-05	0.0
591:	0.1000E-04	0.1000E-05	0.0
594:	0.1000E-01	0.1000E-02	0.0
597:	0.5000E+02	0.1400E+01	0.0
600:	0.5000E+02	0.1400E+01	0.0
603:	0.5000E+02	0.1400E+01	0.0
606:	0.5000E+02	0.1400E+01	0.0
609:	0.4000E+02	0.7000E+02	0.0
612:	0.4000E+02	0.7000E+02	0.0
615:	0.1000E-04	0.1000E-05	0.0
618:	0.1000E-04	0.1000E-05	0.0
621:	0.1000E-04	0.1000E-05	0.0
624:	0.1000E-04	0.1000E-05	0.0
627:	0.5000E+02	0.1400E+01	0.0
630:	0.5000E+02	0.1400E+01	0.0
633:	0.5000E+02	0.1400E+01	0.0
636:	0.5000E+02	0.1400E+01	0.0
639:	0.5000E+02	0.1400E+01	0.0
642:	0.4000E+02	0.7000E+02	0.0
645:	0.1000E-01	0.1000E-02	0.0
648:	0.1000E-04	0.1000E-05	0.0
651:	0.1000E-04	0.1000E-05	0.0
654:	0.1000E-04	0.1000E-05	0.0
657:	0.1000E-01	0.1000E-02	0.0
660:	0.5000E+02	0.1400E+01	0.0
663:	0.5000E+02	0.1400E+01	0.0

664: 0.5000E+02 0.1400E+01 0.0
665: 0.5000E+02 0.1400E+01 0.0
666: 0.5000E+02 0.1400E+01 0.0
667: 0.5000E+02 0.1400E+01 0.0
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673: 0.4000E+02 0.7000E+02 0.0
674: 0.4000E+02 0.7000E+02 0.0
675: 0.4000E+02 0.7000E+02 0.0
676: 0.4000E+02 0.7000E+02 0.0
677: 0.1000E-01 0.1000E-02 0.0
678: 0.1000E-01 0.1000E-02 0.0
679: 0.1000E-04 0.1000E-05 0.0
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681: 0.1000E-04 0.1000E-05 0.0
682: 0.1000E-04 0.1000E-05 0.0
683: 0.1000E-04 0.1000E-05 0.0
684: 0.1000E-04 0.1000E-05 0.0
685: 0.1000E-04 0.1000E-05 0.0
686: 0.1000E-04 0.1000E-05 0.0
687: 0.1000E-04 0.1000E-05 0.0
688: 0.1000E-04 0.1000E-05 0.0
689: 0.1000E-01 0.1000E-02 0.0
690: 0.1000E-01 0.1000E-02 0.0
691: 0.5000E+02 0.1400E+01 0.0
692: 0.5000E+02 0.1400E+01 0.0
693: 0.5000E+02 0.1400E+01 0.0
694: 0.5000E+02 0.1400E+01 0.0
695: 0.5000E+02 0.1400E+01 0.0
696: 0.5000E+02 0.1400E+01 0.0
697: 0.5000E+02 0.1400E+01 0.0
698: 0.5000E+02 0.1400E+01 0.0
699: 0.5000E+02 0.1400E+01 0.0
700: 0.5000E+02 0.1400E+01 0.0
701: 0.5000E+02 0.1400E+01 0.0
702: 0.5000E+02 0.1400E+01 0.0
703: 0.5000E+02 0.1400E+01 0.0
704: 0.5000E+02 0.1400E+01 0.0
705: 0.4000E+01 0.7000E+00 0.0
706: 0.4000E+01 0.7000E+00 0.0
707: 0.4000E+01 0.7000E+00 0.0
708: 0.4000E+01 0.7000E+00 0.0
709: 0.5000E-05 0.5000E-06 0.0
710: 0.5000E-05 0.5000E-06 0.0
711: 0.5000E-05 0.5000E-06 0.0
712: 0.5000E-05 0.5000E-06 0.0
713: 0.5000E-05 0.5000E-06 0.0
714: 0.5000E-05 0.5000E-06 0.0
715: 0.5000E-05 0.5000E-06 0.0
716: 0.5000E-05 0.5000E-06 0.0
717: 0.5000E-05 0.5000E-06 0.0
718: 0.5000E-05 0.5000E-06 0.0
719: 0.5000E-05 0.5000E-06 0.0
720: 0.5000E-05 0.5000E-06 0.0
721: 0.5000E-05 0.5000E-06 0.0
722: 0.5000E-05 0.5000E-06 0.0
723: 0.5000E+02 0.1400E+01 0.0
724: 0.5000E+02 0.1400E+01 0.0
725: 0.5000E+02 0.1400E+01 0.0
726: 0.5000E+02 0.1400E+01 0.0
727: 0.5000E+02 0.1400E+01 0.0
728: 0.5000E+02 0.1400E+01 0.0
729: 0.5000E+02 0.1400E+01 0.0
730: 0.5000E+02 0.1400E+01 0.0
731: 0.5000E+02 0.1400E+01 0.0
732: 0.5000E+02 0.1400E+01 0.0
733: 0.5000E+02 0.1400E+01 0.0
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735: 0.5000E+02 0.1400E+01 0.0
736: 0.5000E+02 0.1400E+01 0.0
737: 0.4000E+02 0.7000E+02 0.0
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743: 0.1000E-04 0.1000E-05 0.0
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752: 0.1000E-04 0.1000E-05 0.0
753: 0.1000E-01 0.1000E-02 0.0
754: 0.1000E-01 0.1000E-02 0.0
755: 0.5000E+02 0.1400E+01 0.0
756: 0.5000E+02 0.1400E+01 0.0
757: 0.5000E+02 0.1400E+01 0.0
758: 0.5000E+02 0.1400E+01 0.0
759: 0.5000E+02 0.1400E+01 0.0
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762: 0.5000E+02 0.1400E+01 0.0
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765: 0.5000E+02 0.1400E+01 0.0
766: 0.5000E+02 0.1400E+01 0.0
767: 0.5000E+02 0.1400E+01 0.0
768: 0.5000E+02 0.1400E+01 0.0
769: 0.4000E+02 0.7000E+02 0.0
770: 0.4000E+02 0.7000E+02 0.0
771: 0.4000E+02 0.7000E+02 0.0
772: 0.4000E+02 0.7000E+02 0.0
773: 0.1000E-01 0.1000E-02 0.0
774: 0.1000E-01 0.1000E-02 0.0
775: 0.1000E-04 0.1000E-05 0.0
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777: 0.1000E-04 0.1000E-05 0.0
778: 0.1000E-04 0.1000E-05 0.0
779: 0.1000E-04 0.1000E-05 0.0
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781: 0.1000E-04 0.1000E-05 0.0
782: 0.1000E-04 0.1000E-05 0.0
783: 0.1000E-04 0.1000E-05 0.0
784: 0.1000E-04 0.1000E-05 0.0
785: 0.1000E-01 0.1000E-02 0.0
786: 0.1000E-01 0.1000E-02 0.0
787: 0.5000E+02 0.1400E+01 0.0
788: 0.5000E+02 0.1400E+01 0.0
789: 0.5000E+02 0.1400E+01 0.0
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791: 0.5000E+02 0.1400E+01 0.0
792: 0.5000E+02 0.1400E+01 0.0
793: 0.5000E+02 0.1400E+01 0.0
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797: 0.5000E+02 0.1400E+01 0.0
798: 0.5000E+02 0.1400E+01 0.0
799: 0.5000E+02 0.1400E+01 0.0
800: 0.5000E+02 0.1400E+01 0.0
801: 0.4000E+02 0.7000E+02 0.0
802: 0.4000E+02 0.7000E+02 0.0
803: 0.4000E+02 0.7000E+02 0.0
804: 0.4000E+02 0.7000E+02 0.0
805: 0.1000E-01 0.1000E-02 0.0
806: 0.1000E-01 0.1000E-02 0.0
807: 0.1000E-04 0.1000E-05 0.0
808: 0.1000E-04 0.1000E-05 0.0
809: 0.1000E-04 0.1000E-05 0.0
810: 0.1000E-04 0.1000E-05 0.0
811: 0.1000E-04 0.1000E-05 0.0
812: 0.1000E-04 0.1000E-05 0.0
813: 0.1000E-04 0.1000E-05 0.0
814: 0.1000E-04 0.1000E-05 0.0
815: 0.1000E-04 0.1000E-05 0.0
816: 0.1000E-04 0.1000E-05 0.0
817: 0.1000E-01 0.1000E-02 0.0
818: 0.1000E-01 0.1000E-02 0.0
819: 0.5000E+02 0.1400E+01 0.0
820: 0.5000E+02 0.1400E+01 0.0
821: 0.5000E+02 0.1400E+01 0.0
822: 0.5000E+02 0.1400E+01 0.0
823: 0.5000E+02 0.1400E+01 0.0
824: 0.5000E+02 0.1400E+01 0.0
825: 0.5000E+02 0.1400E+01 0.0
826: 0.5000E+02 0.1400E+01 0.0
827: 0.5000E+02 0.1400E+01 0.0
828: 0.5000E+02 0.1400E+01 0.0
829: 0.5000E+02 0.1400E+01 0.0
830: 0.5000E+02 0.1400E+01 0.0
831: 0.5000E+02 0.1400E+01 0.0
832: 0.5000E+02 0.1400E+01 0.0
833: 0.4000E+02 0.7000E+02 0.0
834: 0.4000E+02 0.7000E+02 0.0

835:	0.4000E+02	0.7000E+02	0.0
838:	0.1000E-01	0.1000E-02	0.0
841:	0.1000E-04	0.1000E-05	0.0
844:	0.1000E-04	0.1000E-05	0.0
847:	0.1000E-04	0.1000E-05	0.0
850:	0.1000E-01	0.1000E-02	0.0
853:	0.5000E+02	0.1400E+01	0.0
856:	0.5000E+02	0.1400E+01	0.0
859:	0.5000E+02	0.1400E+01	0.0
862:	0.5000E+02	0.1400E+01	0.0
865:	0.4000E+02	0.7000E+02	0.0
868:	0.4000E+02	0.7000E+02	0.0
871:	0.1000E-04	0.1000E-05	0.0
874:	0.1000E-04	0.1000E-05	0.0
877:	0.1000E-04	0.1000E-05	0.0
880:	0.1000E-04	0.1000E-05	0.0
883:	0.5000E+02	0.1400E+01	0.0
886:	0.5000E+02	0.1400E+01	0.0
889:	0.5000E+02	0.1400E+01	0.0
892:	0.5000E+02	0.1400E+01	0.0
895:	0.5000E+02	0.1400E+01	0.0
898:	0.4000E+02	0.7000E+02	0.0
901:	0.1000E-01	0.1000E-02	0.0
904:	0.1000E-04	0.1000E-05	0.0
907:	0.1000E-04	0.1000E-05	0.0
910:	0.1000E-04	0.1000E-05	0.0
913:	0.1000E-01	0.1000E-02	0.0
916:	0.5000E+02	0.1400E+01	0.0
919:	0.5000E+02	0.1400E+01	0.0
922:	0.5000E+02	0.1400E+01	0.0
925:	0.5000E+02	0.1400E+01	0.0
928:	0.5000E+02	0.1400E+01	0.0
931:	0.4000E+02	0.7000E+02	0.0
934:	0.1000E-01	0.1000E-02	0.0
937:	0.1000E-04	0.1000E-05	0.0
940:	0.1000E-04	0.1000E-05	0.0
943:	0.1000E-04	0.1000E-05	0.0
946:	0.1000E-01	0.1000E-02	0.0
949:	0.5000E+02	0.1400E+01	0.0
952:	0.5000E+02	0.1400E+01	0.0
955:	0.5000E+02	0.1400E+01	0.0
958:	0.5000E+02	0.1400E+01	0.0
961:	0.4000E+02	0.7000E+02	0.0
964:	0.4000E+02	0.7000E+02	0.0
967:	0.1000E-04	0.1000E-05	0.0
970:	0.1000E-04	0.1000E-05	0.0
973:	0.1000E-04	0.1000E-05	0.0
976:	0.1000E-04	0.1000E-05	0.0
979:	0.5000E+02	0.1400E+01	0.0
982:	0.5000E+02	0.1400E+01	0.0
985:	0.5000E+02	0.1400E+01	0.0
988:	0.5000E+02	0.1400E+01	0.0
991:	0.5000E+02	0.1400E+01	0.0
994:	0.4000E+02	0.7000E+02	0.0
997:	0.1000E-01	0.1000E-02	0.0
1000:	0.1000E-04	0.1000E-05	0.0
1003:	0.1000E-04	0.1000E-05	0.0

836:	0.4000E+02	0.7000E+02	0.0
839:	0.1000E-04	0.1000E-05	0.0
842:	0.1000E-04	0.1000E-05	0.0
845:	0.1000E-04	0.1000E-05	0.0
848:	0.1000E-04	0.1000E-05	0.0
851:	0.5000E+02	0.1400E+01	0.0
854:	0.5000E+02	0.1400E+01	0.0
857:	0.5000E+02	0.1400E+01	0.0
860:	0.5000E+02	0.1400E+01	0.0
863:	0.5000E+02	0.1400E+01	0.0
866:	0.4000E+02	0.7000E+02	0.0
869:	0.1000E-01	0.1000E-02	0.0
872:	0.1000E-04	0.1000E-05	0.0
875:	0.1000E-04	0.1000E-05	0.0
878:	0.1000E-04	0.1000E-05	0.0
881:	0.1000E-01	0.1000E-02	0.0
884:	0.5000E+02	0.1400E+01	0.0
887:	0.5000E+02	0.1400E+01	0.0
890:	0.5000E+02	0.1400E+01	0.0
893:	0.5000E+02	0.1400E+01	0.0
896:	0.5000E+02	0.1400E+01	0.0
899:	0.4000E+02	0.7000E+02	0.0
902:	0.1000E-01	0.1000E-02	0.0
905:	0.1000E-04	0.1000E-05	0.0
908:	0.1000E-04	0.1000E-05	0.0
911:	0.1000E-04	0.1000E-05	0.0
914:	0.1000E-01	0.1000E-02	0.0
917:	0.5000E+02	0.1400E+01	0.0
920:	0.5000E+02	0.1400E+01	0.0
923:	0.5000E+02	0.1400E+01	0.0
926:	0.5000E+02	0.1400E+01	0.0
929:	0.4000E+02	0.7000E+02	0.0
932:	0.4000E+02	0.7000E+02	0.0
935:	0.1000E-04	0.1000E-05	0.0
938:	0.1000E-04	0.1000E-05	0.0
941:	0.1000E-04	0.1000E-05	0.0
944:	0.1000E-04	0.1000E-05	0.0
947:	0.5000E+02	0.1400E+01	0.0
950:	0.5000E+02	0.1400E+01	0.0
953:	0.5000E+02	0.1400E+01	0.0
956:	0.5000E+02	0.1400E+01	0.0
959:	0.5000E+02	0.1400E+01	0.0
962:	0.4000E+02	0.7000E+02	0.0
965:	0.1000E-01	0.1000E-02	0.0
968:	0.1000E-04	0.1000E-05	0.0
971:	0.1000E-04	0.1000E-05	0.0
974:	0.1000E-04	0.1000E-05	0.0
977:	0.1000E-01	0.1000E-02	0.0
980:	0.5000E+02	0.1400E+01	0.0
983:	0.5000E+02	0.1400E+01	0.0
986:	0.5000E+02	0.1400E+01	0.0
989:	0.5000E+02	0.1400E+01	0.0
992:	0.5000E+02	0.1400E+01	0.0
995:	0.4000E+02	0.7000E+02	0.0
998:	0.1000E-01	0.1000E-02	0.0
1001:	0.1000E-04	0.1000E-05	0.0
1004:	0.1000E-04	0.1000E-05	0.0

837:	0.1000E-01	0.1000E-02	0.0
840:	0.1000E-04	0.1000E-05	0.0
843:	0.1000E-04	0.1000E-05	0.0
846:	0.1000E-04	0.1000E-05	0.0
849:	0.1000E-01	0.1000E-02	0.0
852:	0.5000E+02	0.1400E+01	0.0
855:	0.5000E+02	0.1400E+01	0.0
858:	0.5000E+02	0.1400E+01	0.0
861:	0.5000E+02	0.1400E+01	0.0
864:	0.5000E+02	0.1400E+01	0.0
867:	0.4000E+02	0.7000E+02	0.0
870:	0.1000E-01	0.1000E-02	0.0
873:	0.1000E-04	0.1000E-05	0.0
876:	0.1000E-04	0.1000E-05	0.0
879:	0.1000E-04	0.1000E-05	0.0
882:	0.1000E-01	0.1000E-02	0.0
885:	0.5000E+02	0.1400E+01	0.0
888:	0.5000E+02	0.1400E+01	0.0
891:	0.5000E+02	0.1400E+01	0.0
894:	0.5000E+02	0.1400E+01	0.0
897:	0.4000E+02	0.7000E+02	0.0
900:	0.4000E+02	0.7000E+02	0.0
903:	0.1000E-04	0.1000E-05	0.0
906:	0.1000E-04	0.1000E-05	0.0
909:	0.1000E-04	0.1000E-05	0.0
912:	0.1000E-04	0.1000E-05	0.0
915:	0.5000E+02	0.1400E+01	0.0
918:	0.5000E+02	0.1400E+01	0.0
921:	0.5000E+02	0.1400E+01	0.0
924:	0.5000E+02	0.1400E+01	0.0
927:	0.5000E+02	0.1400E+01	0.0
930:	0.4000E+02	0.7000E+02	0.0
933:	0.1000E-01	0.1000E-02	0.0
936:	0.1000E-04	0.1000E-05	0.0
939:	0.1000E-04	0.1000E-05	0.0
942:	0.1000E-04	0.1000E-05	0.0
945:	0.1000E-01	0.1000E-02	0.0
948:	0.5000E+02	0.1400E+01	0.0
951:	0.5000E+02	0.1400E+01	0.0
954:	0.5000E+02	0.1400E+01	0.0
957:	0.5000E+02	0.1400E+01	0.0
960:	0.5000E+02	0.1400E+01	0.0
963:	0.4000E+02	0.7000E+02	0.0
966:	0.1000E-01	0.1000E-02	0.0
969:	0.1000E-04	0.1000E-05	0.0
972:	0.1000E-04	0.1000E-05	0.0
975:	0.1000E-04	0.1000E-05	0.0
978:	0.1000E-01	0.1000E-02	0.0
981:	0.5000E+02	0.1400E+01	0.0
984:	0.5000E+02	0.1400E+01	0.0
987:	0.5000E+02	0.1400E+01	0.0
990:	0.5000E+02	0.1400E+01	0.0
993:	0.4000E+02	0.7000E+02	0.0
996:	0.4000E+02	0.7000E+02	0.0
999:	0.1000E-04	0.1000E-05	0.0
1002:	0.1000E-04	0.1000E-05	0.0
1005:	0.1000E-04	0.1000E-05	0.0

1006:	0.1000E-04 0.1000E-05 0.0	1007:	0.1000E-04 0.1000E-05 0.0	1008:	0.1000E-04 0.1000E-05 0.0
1009:	0.1000E-01 0.1000E-02 0.0	1010:	0.1000E-01 0.1000E-02 0.0	1011:	0.5000E+02 0.1400E+01 0.0
1012:	0.5000E+02 0.1400E+01 0.0	1013:	0.5000E+02 0.1400E+01 0.0	1014:	0.5000E+02 0.1400E+01 0.0
1015:	0.5000E+02 0.1400E+01 0.0	1016:	0.5000E+02 0.1400E+01 0.0	1017:	0.5000E+02 0.1400E+01 0.0
1018:	0.5000E+02 0.1400E+01 0.0	1019:	0.5000E+02 0.1400E+01 0.0	1020:	0.5000E+02 0.1400E+01 0.0
1021:	0.5000E+02 0.1400E+01 0.0	1022:	0.5000E+02 0.1400E+01 0.0	1023:	0.5000E+02 0.1400E+01 0.0
1024:	0.5000E+02 0.1400E+01 0.0	1025:	0.4000E+02 0.7000E+02 0.0	1026:	0.4000E+02 0.7000E+02 0.0
1027:	0.4000E+02 0.7000E+02 0.0	1028:	0.4000E+02 0.7000E+02 0.0	1029:	0.1000E-01 0.1000E-02 0.0
1030:	0.1000E-01 0.1000E-02 0.0	1031:	0.1000E-04 0.1000E-05 0.0	1032:	0.1000E-04 0.1000E-05 0.0
1033:	0.1000E-04 0.1000E-05 0.0	1034:	0.1000E-04 0.1000E-05 0.0	1035:	0.1000E-04 0.1000E-05 0.0
1036:	0.1000E-04 0.1000E-05 0.0	1037:	0.1000E-04 0.1000E-05 0.0	1038:	0.1000E-04 0.1000E-05 0.0
1039:	0.1000E-04 0.1000E-05 0.0	1040:	0.1000E-04 0.1000E-05 0.0	1041:	0.1000E-01 0.1000E-02 0.0
1042:	0.1000E-01 0.1000E-02 0.0	1043:	0.5000E+02 0.1400E+01 0.0	1044:	0.5000E+02 0.1400E+01 0.0
1045:	0.5000E+02 0.1400E+01 0.0	1046:	0.5000E+02 0.1400E+01 0.0	1047:	0.5000E+02 0.1400E+01 0.0
1048:	0.5000E+02 0.1400E+01 0.0	1049:	0.5000E+02 0.1400E+01 0.0	1050:	0.5000E+02 0.1400E+01 0.0
1051:	0.5000E+02 0.1400E+01 0.0	1052:	0.5000E+02 0.1400E+01 0.0	1053:	0.5000E+02 0.1400E+01 0.0
1054:	0.5000E+02 0.1400E+01 0.0	1055:	0.5000E+02 0.1400E+01 0.0	1056:	0.5000E+02 0.1400E+01 0.0
1057:	0.4000E+02 0.7000E+02 0.0	1058:	0.4000E+02 0.7000E+02 0.0	1059:	0.4000E+02 0.7000E+02 0.0
1060:	0.4000E+02 0.7000E+02 0.0	1061:	0.1000E-01 0.1000E-02 0.0	1062:	0.1000E-01 0.1000E-02 0.0
1063:	0.1000E-04 0.1000E-05 0.0	1064:	0.1000E-04 0.1000E-05 0.0	1065:	0.1000E-04 0.1000E-05 0.0
1066:	0.1000E-04 0.1000E-05 0.0	1067:	0.1000E-04 0.1000E-05 0.0	1068:	0.1000E-04 0.1000E-05 0.0
1069:	0.1000E-04 0.1000E-05 0.0	1070:	0.1000E-04 0.1000E-05 0.0	1071:	0.1000E-04 0.1000E-05 0.0
1072:	0.1000E-04 0.1000E-05 0.0	1073:	0.1000E-01 0.1000E-02 0.0	1074:	0.1000E-01 0.1000E-02 0.0
1075:	0.5000E+02 0.1400E+01 0.0	1076:	0.5000E+02 0.1400E+01 0.0	1077:	0.5000E+02 0.1400E+01 0.0
1078:	0.5000E+02 0.1400E+01 0.0	1079:	0.5000E+02 0.1400E+01 0.0	1080:	0.5000E+02 0.1400E+01 0.0
1081:	0.5000E+02 0.1400E+01 0.0	1082:	0.5000E+02 0.1400E+01 0.0	1083:	0.5000E+02 0.1400E+01 0.0
1084:	0.5000E+02 0.1400E+01 0.0	1085:	0.5000E+02 0.1400E+01 0.0	1086:	0.5000E+02 0.1400E+01 0.0
1087:	0.5000E+02 0.1400E+01 0.0	1088:	0.5000E+02 0.1400E+01 0.0	1089:	0.4000E+02 0.7000E+02 0.0
1090:	0.4000E+02 0.7000E+02 0.0	1091:	0.4000E+02 0.7000E+02 0.0	1092:	0.4000E+02 0.7000E+02 0.0
1093:	0.1000E-01 0.1000E-02 0.0	1094:	0.1000E-01 0.1000E-02 0.0	1095:	0.1000E-04 0.1000E-05 0.0
1096:	0.1000E-04 0.1000E-05 0.0	1097:	0.1000E-04 0.1000E-05 0.0	1098:	0.1000E-04 0.1000E-05 0.0
1099:	0.1000E-04 0.1000E-05 0.0	1100:	0.1000E-04 0.1000E-05 0.0	1101:	0.1000E-04 0.1000E-05 0.0
1102:	0.1000E-04 0.1000E-05 0.0	1103:	0.1000E-04 0.1000E-05 0.0	1104:	0.1000E-04 0.1000E-05 0.0
1105:	0.1000E-01 0.1000E-02 0.0	1106:	0.1000E-01 0.1000E-02 0.0	1107:	0.5000E+02 0.1400E+01 0.0
1108:	0.5000E+02 0.1400E+01 0.0	1109:	0.5000E+02 0.1400E+01 0.0	1110:	0.5000E+02 0.1400E+01 0.0
1111:	0.5000E+02 0.1400E+01 0.0	1112:	0.5000E+02 0.1400E+01 0.0	1113:	0.5000E+02 0.1400E+01 0.0
1114:	0.5000E+02 0.1400E+01 0.0	1115:	0.5000E+02 0.1400E+01 0.0	1116:	0.5000E+02 0.1400E+01 0.0
1117:	0.5000E+02 0.1400E+01 0.0	1118:	0.5000E+02 0.1400E+01 0.0	1119:	0.5000E+02 0.1400E+01 0.0
1120:	0.5000E+02 0.1400E+01 0.0	1121:	0.4000E+02 0.7000E+02 0.0	1122:	0.4000E+02 0.7000E+02 0.0
1123:	0.4000E+02 0.7000E+02 0.0	1124:	0.4000E+02 0.7000E+02 0.0	1125:	0.1000E-01 0.1000E-02 0.0
1126:	0.1000E-01 0.1000E-02 0.0	1127:	0.1000E-01 0.1000E-02 0.0	1128:	0.1000E-01 0.1000E-02 0.0
1129:	0.1000E-01 0.1000E-02 0.0	1130:	0.1000E-01 0.1000E-02 0.0	1131:	0.1000E-04 0.1000E-05 0.0
1132:	0.1000E-04 0.1000E-05 0.0	1133:	0.1000E-01 0.1000E-02 0.0	1134:	0.1000E-01 0.1000E-02 0.0
1135:	0.1000E-01 0.1000E-02 0.0	1136:	0.1000E-01 0.1000E-02 0.0	1137:	0.1000E-01 0.1000E-02 0.0
1138:	0.1000E-01 0.1000E-02 0.0	1139:	0.5000E+02 0.1400E+01 0.0	1140:	0.5000E+02 0.1400E+01 0.0
1141:	0.5000E+02 0.1400E+01 0.0	1142:	0.5000E+02 0.1400E+01 0.0	1143:	0.5000E+02 0.1400E+01 0.0
1144:	0.5000E+02 0.1400E+01 0.0	1145:	0.5000E+02 0.1400E+01 0.0	1146:	0.5000E+02 0.1400E+01 0.0
1147:	0.5000E+02 0.1400E+01 0.0	1148:	0.5000E+02 0.1400E+01 0.0	1149:	0.5000E+02 0.1400E+01 0.0
1150:	0.5000E+02 0.1400E+01 0.0	1151:	0.5000E+02 0.1400E+01 0.0	1152:	0.5000E+02 0.1400E+01 0.0
1153:	0.4000E+02 0.7000E+02 0.0	1154:	0.4000E+02 0.7000E+02 0.0	1155:	0.4000E+02 0.7000E+02 0.0
1156:	0.4000E+02 0.7000E+02 0.0	1157:	0.1000E-01 0.1000E-02 0.0	1158:	0.1000E-01 0.1000E-02 0.0
1159:	0.1000E-01 0.1000E-02 0.0	1160:	0.1000E-01 0.1000E-02 0.0	1161:	0.1000E-01 0.1000E-02 0.0
1162:	0.1000E-01 0.1000E-02 0.0	1163:	0.1000E-01 0.1000E-02 0.0	1164:	0.1000E-01 0.1000E-02 0.0
1165:	0.1000E-01 0.1000E-02 0.0	1166:	0.1000E-01 0.1000E-02 0.0	1167:	0.1000E-01 0.1000E-02 0.0
1168:	0.1000E-01 0.1000E-02 0.0	1169:	0.1000E-01 0.1000E-02 0.0	1170:	0.1000E-01 0.1000E-02 0.0
1171:	0.5000E+02 0.1400E+01 0.0	1172:	0.5000E+02 0.1400E+01 0.0	1173:	0.5000E+02 0.1400E+01 0.0
1174:	0.5000E+02 0.1400E+01 0.0	1175:	0.5000E+02 0.1400E+01 0.0	1176:	0.5000E+02 0.1400E+01 0.0

1177:	0.5000E+02	0.1400E+01	0.0	1178:	0.5000E+02	0.1400E+01	0.0	1179:	0.5000E+02	0.1400E+01	0.0
1180:	0.5000E+02	0.1400E+01	0.0	1181:	0.5000E+02	0.1400E+01	0.0	1182:	0.5000E+02	0.1400E+01	0.0
1183:	0.5000E+02	0.1400E+01	0.0	1184:	0.5000E+02	0.1400E+01	0.0	1185:	0.4000E+02	0.7000E+02	0.0
1186:	0.4000E+02	0.7000E+02	0.0	1187:	0.4000E+02	0.7000E+02	0.0	1188:	0.4000E+02	0.7000E+02	0.0
1189:	0.4000E+02	0.7000E+02	0.0	1190:	0.4000E+02	0.7000E+02	0.0	1191:	0.1000E-01	0.1000E-02	0.0
1192:	0.1000E-01	0.1000E-02	0.0	1193:	0.1000E-01	0.1000E-02	0.0	1194:	0.1000E-01	0.1000E-02	0.0
1195:	0.1000E-01	0.1000E-02	0.0	1196:	0.1000E-01	0.1000E-02	0.0	1197:	0.1000E-01	0.1000E-02	0.0
1198:	0.1000E-01	0.1000E-02	0.0	1199:	0.1000E-01	0.1000E-02	0.0	1200:	0.1000E-01	0.1000E-02	0.0
1201:	0.5000E+02	0.1400E+01	0.0	1202:	0.5000E+02	0.1400E+01	0.0	1203:	0.5000E+02	0.1400E+01	0.0
1204:	0.5000E+02	0.1400E+01	0.0	1205:	0.5000E+02	0.1400E+01	0.0	1206:	0.5000E+02	0.1400E+01	0.0
1207:	0.5000E+02	0.1400E+01	0.0	1208:	0.5000E+02	0.1400E+01	0.0	1209:	0.5000E+02	0.1400E+01	0.0
1210:	0.5000E+02	0.1400E+01	0.0	1211:	0.5000E+02	0.1400E+01	0.0	1212:	0.5000E+02	0.1400E+01	0.0
1213:	0.5000E+02	0.1400E+01	0.0	1214:	0.5000E+02	0.1400E+01	0.0	1215:	0.5000E+02	0.1400E+01	0.0
1216:	0.5000E+02	0.1400E+01	0.0	1217:	0.4000E+02	0.7000E+02	0.0	1218:	0.4000E+02	0.7000E+02	0.0
1219:	0.4000E+02	0.7000E+02	0.0	1220:	0.4000E+02	0.7000E+02	0.0	1221:	0.4000E+02	0.7000E+02	0.0
1222:	0.4000E+02	0.7000E+02	0.0	1223:	0.1000E-01	0.1000E-02	0.0	1224:	0.1000E-01	0.1000E-02	0.0
1225:	0.1000E-01	0.1000E-02	0.0	1226:	0.1000E-01	0.1000E-02	0.0	1227:	0.1000E-01	0.1000E-02	0.0
1228:	0.1000E-01	0.1000E-02	0.0	1229:	0.1000E-01	0.1000E-02	0.0	1230:	0.1000E-01	0.1000E-02	0.0
1231:	0.1000E-01	0.1000E-02	0.0	1232:	0.1000E-01	0.1000E-02	0.0	1233:	0.5000E+02	0.1400E+01	0.0
1234:	0.5000E+02	0.1400E+01	0.0	1235:	0.5000E+02	0.1400E+01	0.0	1236:	0.5000E+02	0.1400E+01	0.0
1237:	0.5000E+02	0.1400E+01	0.0	1238:	0.5000E+02	0.1400E+01	0.0	1239:	0.5000E+02	0.1400E+01	0.0
1240:	0.5000E+02	0.1400E+01	0.0	1241:	0.5000E+02	0.1400E+01	0.0	1242:	0.5000E+02	0.1400E+01	0.0
1243:	0.5000E+02	0.1400E+01	0.0	1244:	0.5000E+02	0.1400E+01	0.0	1245:	0.5000E+02	0.1400E+01	0.0
1246:	0.5000E+02	0.1400E+01	0.0	1247:	0.5000E+02	0.1400E+01	0.0	1248:	0.5000E+02	0.1400E+01	0.0
1249:	0.4000E+02	0.7000E+02	0.0	1250:	0.4000E+02	0.7000E+02	0.0	1251:	0.4000E+02	0.7000E+02	0.0
1252:	0.4000E+02	0.7000E+02	0.0	1253:	0.4000E+02	0.7000E+02	0.0	1254:	0.4000E+02	0.7000E+02	0.0
1255:	0.1000E-01	0.1000E-02	0.0	1256:	0.1000E-01	0.1000E-02	0.0	1257:	0.1000E-01	0.1000E-02	0.0
1258:	0.1000E-01	0.1000E-02	0.0	1259:	0.1000E-01	0.1000E-02	0.0	1260:	0.1000E-01	0.1000E-02	0.0
1261:	0.1000E-01	0.1000E-02	0.0	1262:	0.1000E-01	0.1000E-02	0.0	1263:	0.1000E-01	0.1000E-02	0.0
1264:	0.1000E-01	0.1000E-02	0.0	1265:	0.5000E+02	0.1400E+01	0.0	1266:	0.5000E+02	0.1400E+01	0.0
1267:	0.5000E+02	0.1400E+01	0.0	1268:	0.5000E+02	0.1400E+01	0.0	1269:	0.5000E+02	0.1400E+01	0.0
1270:	0.5000E+02	0.1400E+01	0.0	1271:	0.5000E+02	0.1400E+01	0.0	1272:	0.5000E+02	0.1400E+01	0.0
1273:	0.5000E+02	0.1400E+01	0.0	1274:	0.5000E+02	0.1400E+01	0.0	1275:	0.5000E+02	0.1400E+01	0.0
1276:	0.5000E+02	0.1400E+01	0.0	1277:	0.5000E+02	0.1400E+01	0.0	1278:	0.5000E+02	0.1400E+01	0.0
1279:	0.5000E+02	0.1400E+01	0.0	1280:	0.5000E+02	0.1400E+01	0.0	1281:	0.4000E+02	0.7000E+02	0.0
1282:	0.4000E+02	0.7000E+02	0.0	1283:	0.4000E+02	0.7000E+02	0.0	1284:	0.4000E+02	0.7000E+02	0.0
1285:	0.4000E+02	0.7000E+02	0.0	1286:	0.4000E+02	0.7000E+02	0.0	1287:	0.1000E-01	0.1000E-02	0.0
1288:	0.1000E-01	0.1000E-02	0.0	1289:	0.1000E-01	0.1000E-02	0.0	1290:	0.1000E-01	0.1000E-02	0.0
1291:	0.1000E-01	0.1000E-02	0.0	1292:	0.1000E-01	0.1000E-02	0.0	1293:	0.1000E-01	0.1000E-02	0.0
1294:	0.1000E-01	0.1000E-02	0.0	1295:	0.1000E-01	0.1000E-02	0.0	1296:	0.1000E-01	0.1000E-02	0.0
1297:	0.5000E+02	0.1400E+01	0.0	1298:	0.5000E+02	0.1400E+01	0.0	1299:	0.5000E+02	0.1400E+01	0.0
1300:	0.5000E+02	0.1400E+01	0.0	1301:	0.5000E+02	0.1400E+01	0.0	1302:	0.5000E+02	0.1400E+01	0.0
1303:	0.5000E+02	0.1400E+01	0.0	1304:	0.5000E+02	0.1400E+01	0.0	1305:	0.5000E+02	0.1400E+01	0.0
1306:	0.5000E+02	0.1400E+01	0.0	1307:	0.5000E+02	0.1400E+01	0.0	1308:	0.5000E+02	0.1400E+01	0.0
1309:	0.5000E+02	0.1400E+01	0.0	1310:	0.5000E+02	0.1400E+01	0.0	1311:	0.5000E+02	0.1400E+01	0.0
1312:	0.5000E+02	0.1400E+01	0.0	1313:	0.4000E+02	0.7000E+02	0.0	1314:	0.4000E+02	0.7000E+02	0.0
1315:	0.4000E+02	0.7000E+02	0.0	1316:	0.4000E+02	0.7000E+02	0.0	1317:	0.4000E+02	0.7000E+02	0.0
1318:	0.4000E+02	0.7000E+02	0.0	1319:	0.4000E+02	0.7000E+02	0.0	1320:	0.4000E+02	0.7000E+02	0.0
1221:	0.4000E+02	0.7000E+02	0.0	1322:	0.4000E+02	0.7000E+02	0.0	1323:	0.4000E+02	0.7000E+02	0.0
1324:	0.4000E+02	0.7000E+02	0.0	1325:	0.5000E+02	0.1400E+01	0.0	1326:	0.5000E+02	0.1400E+01	0.0
1327:	0.5000E+02	0.1400E+01	0.0	1328:	0.5000E+02	0.1400E+01	0.0	1329:	0.5000E+02	0.1400E+01	0.0
1330:	0.5000E+02	0.1400E+01	0.0	1331:	0.5000E+02	0.1400E+01	0.0	1332:	0.5000E+02	0.1400E+01	0.0
1333:	0.5000E+02	0.1400E+01	0.0	1334:	0.5000E+02	0.1400E+01	0.0	1335:	0.5000E+02	0.1400E+01	0.0
1336:	0.5000E+02	0.1400E+01	0.0	1337:	0.5000E+02	0.1400E+01	0.0	1338:	0.5000E+02	0.1400E+01	0.0
1339:	0.5000E+02	0.1400E+01	0.0	1340:	0.5000E+02	0.1400E+01	0.0	1341:	0.5000E+02	0.1400E+01	0.0
1342:	0.5000E+02	0.1400E+01	0.0	1343:	0.5000E+02	0.1400E+01	0.0	1344:	0.5000E+02	0.1400E+01	0.0
1345:	0.4000E+02	0.7000E+02	0.0	1346:	0.4000E+02	0.7000E+02	0.0	1347:	0.4000E+02	0.7000E+02	0.0

1348:	0.4000E+02	0.7000E+02	0.0	1349:	0.4000E+02	0.7000E+02	0.0	1350:	0.4000E+02	0.7000E+02	0.0
1351:	0.4000E+02	0.7000E+02	0.0	1352:	0.4000E+02	0.7000E+02	0.0	1353:	0.4000E+02	0.7000E+02	0.0
1354:	0.4000E+02	0.7000E+02	0.0	1355:	0.4000E+02	0.7000E+02	0.0	1356:	0.4000E+02	0.7000E+02	0.0
1357:	0.5000E+02	0.1400E+01	0.0	1358:	0.5000E+02	0.1400E+01	0.0	1359:	0.5000E+02	0.1400E+01	0.0
1360:	0.5000E+02	0.1400E+01	0.0	1361:	0.5000E+02	0.1400E+01	0.0	1362:	0.5000E+02	0.1400E+01	0.0
1363:	0.5000E+02	0.1400E+01	0.0	1364:	0.5000E+02	0.1400E+01	0.0	1365:	0.5000E+02	0.1400E+01	0.0
1366:	0.5000E+02	0.1400E+01	0.0	1367:	0.5000E+02	0.1400E+01	0.0	1368:	0.5000E+02	0.1400E+01	0.0
1369:	0.5000E+02	0.1400E+01	0.0	1370:	0.5000E+02	0.1400E+01	0.0	1371:	0.5000E+02	0.1400E+01	0.0
1372:	0.5000E+02	0.1400E+01	0.0	1373:	0.5000E+02	0.1400E+01	0.0	1374:	0.5000E+02	0.1400E+01	0.0
1375:	0.5000E+02	0.1400E+01	0.0	1376:	0.5000E+02	0.1400E+01	0.0	1377:	0.4000E+02	0.7000E+02	0.0
1378:	0.4000E+02	0.7000E+02	0.0	1379:	0.4000E+02	0.7000E+02	0.0	1380:	0.4000E+02	0.7000E+02	0.0
1381:	0.4000E+02	0.7000E+02	0.0	1382:	0.4000E+02	0.7000E+02	0.0	1383:	0.4000E+02	0.7000E+02	0.0
1384:	0.4000E+02	0.7000E+02	0.0	1385:	0.4000E+02	0.7000E+02	0.0	1386:	0.4000E+02	0.7000E+02	0.0
1387:	0.4000E+02	0.7000E+02	0.0	1388:	0.4000E+02	0.7000E+02	0.0	1389:	0.5000E+02	0.1400E+01	0.0
1390:	0.5000E+02	0.1400E+01	0.0	1391:	0.5000E+02	0.1400E+01	0.0	1392:	0.5000E+02	0.1400E+01	0.0
1393:	0.5000E+02	0.1400E+01	0.0	1394:	0.5000E+02	0.1400E+01	0.0	1395:	0.5000E+02	0.1400E+01	0.0
1396:	0.5000E+02	0.1400E+01	0.0	1397:	0.5000E+02	0.1400E+01	0.0	1398:	0.5000E+02	0.1400E+01	0.0
1399:	0.5000E+02	0.1400E+01	0.0	1400:	0.5000E+02	0.1400E+01	0.0	1401:	0.5000E+02	0.1400E+01	0.0
1402:	0.5000E+02	0.1400E+01	0.0	1403:	0.5000E+02	0.1400E+01	0.0	1404:	0.5000E+02	0.1400E+01	0.0
1405:	0.5000E+02	0.1400E+01	0.0	1406:	0.5000E+02	0.1400E+01	0.0	1407:	0.5000E+02	0.1400E+01	0.0
1408:	0.5000E+02	0.1400E+01	0.0								

FINITE ELEMENT GRID SUMMARY

NUMBER OF NODES	765
NUMBER OF ELEMENTS	1408
ESTIMATED BANDWIDTH	19
NUMBER OF CONSTANT-HEAD NODES	24
NUMBER OF DEGREES OF FREEDOM	741
FINAL BANDWIDTH	19

STEADY-STATE POTENTIAL DISTRIBUTION

NODE	TOTAL-HEAD	NODE	TOTAL-HEAD	NODE	TOTAL-HEAD	NODE	TOTAL-HEAD	NODE	TOTAL-HEAD
1	6085.871	2	6085.936	3	6086.131	4	6086.457	5	6086.917
6	6087.513	7	6088.249	8	6089.130	9	6090.161	10	6091.349
11	6092.703	12	6094.230	13	6095.942	14	6097.850	15	6099.973
16	6099.980	17	6100.000	18	6072.017	19	6072.039	20	6072.106
21	6072.217	22	6072.372	23	6072.568	24	6072.805	25	6073.081
26	6073.394	27	6073.740	28	6074.117	29	6074.520	30	6074.946
31	6074.953	32	6074.973	33	6074.987	34	6075.000	35	6048.611
36	6048.624	37	6048.664	38	6048.730	39	6048.821	40	6048.938
41	6049.079	42	6049.242	43	6049.428	44	6049.633	45	6049.859
46	6049.866	47	6049.889	48	6049.905	49	6049.922	50	6049.959
51	6050.000	52	6019.528	53	6019.554	54	6019.630	55	6019.757
56	6019.936	57	6020.166	58	6020.448	59	6020.783	60	6021.172
61	6021.183	62	6021.216	63	6021.239	64	6021.265	65	6021.314
66	6021.347	67	6022.570	68	6025.000	69	5979.585	70	5979.613
71	5979.697	72	5979.839	73	5980.039	74	5980.299	75	5980.622
76	5980.636	77	5980.679	78	5980.709	79	5980.762	80	5980.794
81	5980.804	82	5951.260	83	5922.397	84	5923.054	85	5925.000
86	5927.680	87	5927.652	88	5927.565	89	5927.420	90	5927.214
91	5927.224	92	5927.256	93	5927.275	94	5927.290	95	5927.303
96	5862.650	97	5798.218	98	5733.849	99	5735.935	100	5742.426
101	5746.485	102	5750.000	103	5888.015	104	5888.013	105	5888.007
106	5888.017	107	5888.047	108	5888.067	109	5888.087	110	5888.116
111	5888.123	112	5792.470	113	5697.425	114	5602.396	115	5603.476
116	5604.152	117	5603.864	118	5602.508	119	5600.000	120	5849.137
121	5849.384	122	5850.129	123	5850.144	124	5850.191	125	5850.218
126	5850.225	127	5742.965	128	5635.837	129	5528.000	130	5528.326
131	5529.622	132	5530.168	133	5530.003	134	5529.106	135	5527.450
136	5525.000	137	5704.595	138	5704.593	139	5704.587	140	5704.587
141	5671.457	142	5638.079	143	5604.213	144	5569.615	145	5534.539
146	5499.234	147	5499.246	148	5499.324	149	5499.440	150	5499.576
151	5499.719	152	5499.861	153	5500.000	154	5560.749	155	5560.761
156	5560.800	157	5560.812	158	5545.691	159	5530.184	160	5514.353
161	5498.312	162	5482.175	163	5466.064	164	5466.218	165	5466.707
166	5467.545	167	5468.754	168	5470.366	169	5472.429	170	5475.000
171	5513.109	172	5513.112	173	5513.122	174	5513.134	175	5502.199
176	5491.345	177	5469.526	178	5447.288	179	5424.574	180	5413.099
181	5413.137	182	5413.266	183	5413.483	184	5413.778	185	5414.141
186	5414.556	187	5415.000	188	5441.923	189	5441.923	190	5441.923
191	5441.811	192	5441.695	193	5441.620	194	5412.603	195	5383.629
196	5354.651	197	5354.598	198	5354.608	199	5354.638	200	5354.685
201	5354.748	202	5354.825	203	5354.910	204	5355.000	205	5370.734
206	5370.734	207	5370.735	208	5371.356	209	5372.276	210	5372.547
211	5346.602	212	5320.749	213	5294.941	214	5294.916	215	5294.918
216	5294.924	217	5294.934	218	5294.948	219	5294.964	220	5294.981
221	5295.000	222	5299.530	223	5299.530	224	5299.530	225	5299.519
226	5286.812	227	5274.029	228	5261.099	229	5248.071	230	5234.995
231	5234.982	232	5234.983	233	5234.984	234	5234.986	235	5234.989
236	5234.992	237	5234.996	238	5235.000	239	5228.326	240	5228.326
241	5228.326	242	5228.315	243	5217.656	244	5206.995	245	5196.333
246	5185.670	247	5175.006	248	5174.995	249	5174.996	250	5174.996
251	5174.996	252	5174.997	253	5174.998	254	5174.999	255	5175.000

256	5157.122	257	5157.122	258	5157.122	259	5157.114	260	5148.692
261	5140.269	262	5131.847	263	5123.425	264	5115.003	265	5114.995
266	5114.995	267	5114.995	268	5114.996	269	5114.997	270	5114.998
271	5114.999	272	5115.000	273	5085.918	274	5085.918	275	5085.918
276	5085.912	277	5079.726	278	5073.541	279	5067.355	280	5061.170
281	5054.985	282	5054.979	283	5054.979	284	5054.981	285	5054.983
286	5054.987	287	5054.991	288	5054.995	289	5055.000	290	5014.715
291	5014.715	292	5014.715	293	5014.711	294	5010.748	295	5006.785
296	5002.823	297	4998.862	298	4994.902	299	4994.899	300	4994.902
301	4994.909	302	4994.921	303	4994.937	304	4994.956	305	4994.977
306	4995.000	307	4943.512	308	4943.512	309	4943.512	310	4943.510
311	4941.705	312	4939.903	313	4938.102	314	4936.307	315	4934.516
316	4934.518	317	4934.530	318	4934.565	319	4934.622	320	4934.698
321	4934.790	322	4934.892	323	4935.000	324	4872.308	325	4872.308
326	4872.308	327	4872.308	328	4872.360	329	4872.418	330	4872.488
331	4872.577	332	4872.691	333	4872.707	334	4872.761	335	4872.922
336	4873.185	337	4873.540	338	4873.975	339	4874.470	340	4875.000
341	4801.104	342	4801.104	343	4801.104	344	4801.105	345	4801.669
346	4802.255	347	4802.884	348	4803.577	349	4804.356	350	4804.412
351	4804.608	352	4805.200	353	4806.203	354	4807.641	355	4809.552
356	4811.983	357	4815.000	358	4729.901	359	4729.901	360	4729.901
361	4729.898	362	4726.418	363	4722.951	364	4719.506	365	4716.086
366	4712.694	367	4712.704	368	4712.759	369	4712.920	370	4713.183
371	4713.538	372	4713.974	373	4714.470	374	4715.000	375	4658.698
376	4658.698	377	4658.698	378	4659.011	379	4648.350	380	4639.033
381	4630.638	382	4622.755	383	4614.980	384	4614.511	385	4614.522
386	4614.558	387	4614.615	388	4614.692	389	4614.784	390	4614.889
391	4615.000	392	3946.579	393	3946.579	394	3946.579	395	3946.423
396	4061.832	397	4175.900	398	4289.049	399	4401.693	400	4514.238
401	4514.871	402	4514.873	403	4514.877	404	4514.882	405	4514.889
406	4514.896	407	4514.902	408	4514.904	409	3875.373	410	3875.373
411	3875.373	412	3875.481	413	3983.394	414	4091.300	415	4199.198
416	4307.088	417	4414.977	418	4415.086	419	4415.086	420	4415.087
421	4415.087	422	4415.088	423	4415.088	424	4415.088	425	4415.088
426	3804.165	427	3804.165	428	3804.165	429	3804.267	430	3906.452
431	4008.636	432	4110.819	433	4213.003	434	4315.187	435	4315.290
436	4315.290	437	4315.290	438	4315.290	439	4315.290	440	4315.290
441	4315.290	442	4315.290	443	3732.954	444	3732.954	445	3732.954
446	3733.051	447	3829.520	448	3925.989	449	4022.459	450	4118.928
451	4215.398	452	4215.494	453	4215.494	454	4215.494	455	4215.494
456	4215.494	457	4215.494	458	4215.494	459	4215.494	460	3661.741
461	3661.741	462	3661.741	463	3661.831	464	3752.586	465	3843.341
466	3934.097	467	4024.852	468	4115.607	469	4115.697	470	4115.697
471	4115.697	472	4115.698	473	4115.698	474	4115.698	475	4115.698
476	4115.698	477	3590.524	478	3590.524	479	3590.524	480	3590.609
481	3675.651	482	3760.693	483	3845.734	484	3930.776	485	4015.817
486	4015.902	487	4015.902	488	4015.902	489	4015.902	490	4015.902
491	4015.902	492	4015.902	493	4015.902	494	3519.306	495	3519.306
496	3519.306	497	3519.385	498	3598.713	499	3678.041	500	3757.370
501	3836.698	502	3916.026	503	3916.106	504	3916.106	505	3916.106
506	3916.106	507	3916.107	508	3916.107	509	3916.107	510	3916.107
511	3448.086	512	3448.086	513	3448.086	514	3448.159	515	3521.775
516	3595.390	517	3669.007	518	3742.622	519	3816.238	520	3816.311
521	3816.311	522	3816.311	523	3816.311	524	3816.311	525	3816.311
526	3816.311	527	3816.311	528	3376.863	529	3376.863	530	3376.863
531	3376.931	532	3444.835	533	3512.740	534	3580.644	535	3648.547
536	3716.451	537	3716.519	538	3716.520	539	3716.520	540	3716.520

541	3716.520	542	3716.520	543	3716.520	544	3716.520	545	3305.639
546	3305.639	547	3305.639	548	3305.701	549	3367.893	550	3430.085
551	3492.276	552	3554.468	553	3616.660	554	3616.722	555	3616.722
556	3616.722	557	3616.722	558	3616.722	559	3616.722	560	3616.722
561	3616.722	562	3234.413	563	3234.413	564	3234.413	565	3234.469
566	3290.949	567	3347.430	568	3403.911	569	3460.392	570	3516.872
571	3516.928	572	3516.928	573	3516.928	574	3516.928	575	3516.928
576	3516.928	577	3516.928	578	3516.928	579	3163.186	580	3163.186
581	3163.186	582	3163.236	583	3213.785	584	3264.541	585	3315.714
586	3366.492	587	3417.079	588	3417.133	589	3417.133	590	3417.134
591	3417.134	592	3417.135	593	3417.135	594	3417.135	595	3417.135
596	3091.957	597	3091.957	598	3091.957	599	3092.016	600	3092.243
601	3092.686	602	3311.885	603	3313.113	604	3315.696	605	3317.326
606	3317.329	607	3317.334	608	3317.339	609	3317.344	610	3317.349
611	3317.352	612	3317.353	613	3020.726	614	3020.726	615	3020.726
616	3044.733	617	3068.968	618	3093.502	619	3143.257	620	3168.210
621	3192.895	622	3217.379	623	3217.417	624	3217.477	625	3217.544
626	3217.606	627	3217.656	628	3217.688	629	3217.699	630	2948.860
631	2948.857	632	2948.848	633	2948.836	634	2981.984	635	3014.985
636	3047.913	637	3080.720	638	3113.475	639	3114.914	640	3116.194
641	3117.219	642	3118.018	643	3118.616	644	3119.031	645	3119.276
646	3119.357	647	2900.338	648	2900.338	649	2900.338	650	2900.338
651	2926.291	652	2952.247	653	2978.209	654	3004.180	655	3030.162
656	3030.209	657	3030.289	658	3030.383	659	3030.477	660	3030.560
661	3030.625	662	3030.665	663	3030.679	664	2851.363	665	2851.363
666	2851.364	667	2851.364	668	2869.785	669	2888.209	670	2906.634
671	2925.063	672	2943.493	673	2943.510	674	2943.534	675	2943.562
676	2943.591	677	2943.618	678	2943.640	679	2943.654	680	2943.659
681	2802.061	682	2802.061	683	2802.061	684	2802.061	685	2812.858
686	2823.670	687	2834.513	688	2845.402	689	2856.332	690	2856.397
691	2856.527	692	2856.687	693	2856.850	694	2856.994	695	2857.107
696	2857.178	697	2857.202	698	2752.569	699	2752.568	700	2752.567
701	2752.564	702	2752.569	703	2752.598	704	2752.652	705	2756.693
706	2762.376	707	2765.347	708	2767.754	709	2769.675	710	2771.169
711	2772.285	712	2773.058	713	2773.512	714	2773.661	715	2707.352
716	2707.352	717	2707.353	718	2707.355	719	2707.357	720	2707.360
721	2707.363	722	2707.575	723	2707.794	724	2707.963	725	2708.072
726	2708.125	727	2708.131	728	2708.104	729	2708.064	730	2708.030
731	2708.016	732	2659.769	733	2659.767	734	2659.760	735	2659.748
736	2659.731	737	2659.709	738	2659.682	739	2658.076	740	2656.198
741	2654.088	742	2651.800	743	2649.407	744	2647.006	745	2644.731
746	2642.755	747	2641.309	748	2640.695	749	2630.340	750	2630.332
751	2630.309	752	2630.269	753	2630.214	754	2630.143	755	2630.056
756	2624.824	757	2618.480	758	2610.874	759	2601.822	760	2591.095
761	2578.421	762	2563.455	763	2545.763	764	2524.830	765	2500.000

VELOCITY FIELD

		COLUMN: 1	2	3	4	5	6	7	8	9
ROW 33	HORZ:	-.4809E+00	0.4809E+00	0.4809E+00	0.6012E+00	0.2405E+01	0.4208E+01	0.3607E+01	0.1803E+01	0.6012E+00
	VERT:	-.3122E-01	-.3122E-01	-.2088E-01	-.1288E-02	-.7560E-01	-.6054E-01	-.1093E+00	0.7804E-01	0.7622E-01
ROW 32	HORZ:	-.4808E+00	0.4808E+00	0.4815E+00	0.6586E+00	0.2393E+01	0.4246E+01	0.3462E+01	0.1805E+01	0.6634E+00
	VERT:	-.2088E-01	-.2088E-01	-.6440E-01	-.7560E-01	-.6054E-01	-.1093E+00	0.7804E-01	0.7622E-01	-.4336E-02
ROW 31	HORZ:	-.4808E+00	0.4808E+00	0.4815E+00	0.6586E+00	0.2393E+01	0.4246E+01	0.3462E+01	0.1805E+01	0.6634E+00
	VERT:	-.1041E-01	-.1041E-01	-.2087E-01	-.1138E-02	-.3806E-01	-.2044E-01	-.1263E+00	0.4217E-01	0.5152E-01
ROW 30	HORZ:	-.4809E+00	0.4809E+00	0.4819E+00	0.6871E+00	0.2379E+01	0.4328E+01	0.3332E+01	0.1798E+01	0.7067E+00
	VERT:	-.2087E-01	-.2087E-01	-.5688E-01	-.3806E-01	-.2044E-01	-.1263E+00	0.4217E-01	0.5152E-01	-.4418E-02
ROW 29	HORZ:	-.1202E-05	0.1202E-05	0.4819E+00	0.5497E+00	0.4759E-03	0.8655E-03	0.3332E+01	0.1798E+01	0.7067E+00
	VERT:	-.4718E-06	-.4718E-06	-.3129E-01	-.2606E-01	-.7340E-06	0.6414E-03	-.2019E+00	0.8967E-02	0.2791E-01
ROW 28	HORZ:	-.1101E-05	0.1101E-05	0.4818E+00	0.5500E+00	0.3369E-03	0.1036E-02	0.3169E+01	0.1783E+01	0.7317E+00
	VERT:	-.4470E-08	-.4470E-08	-.2606E-01	-.5138E-01	0.6414E-03	-.1442E-03	0.8967E-02	0.2791E-01	-.4436E-02
ROW 27	HORZ:	-.1101E-05	0.1101E-05	0.4818E+00	0.5500E+00	0.3369E-03	0.1036E-02	0.3169E+01	0.1783E+01	0.7317E+00
	VERT:	-.4241E-06	-.4241E-06	-.1043E-01	-.2458E-01	-.1074E-05	0.6565E-03	-.6490E-01	-.2103E-01	0.5153E-02
ROW 26	HORZ:	-.1010E-05	0.1010E-05	0.4820E+00	0.5506E+00	0.1946E-03	0.1188E-02	0.3135E+01	0.1763E+01	0.7389E+00
	VERT:	-.1490E-08	-.1490E-08	-.2458E-01	-.7517E-01	0.6565E-03	-.4636E-04	-.2103E-01	0.5153E-02	-.4230E-02
ROW 25	HORZ:	-.1010E-05	0.1010E-05	0.1205E-05	0.5506E+00	0.7784E+00	0.1188E-02	0.6270E-03	0.1763E+01	0.7389E+00
	VERT:	-.3804E-06	-.3804E-06	-.9475E-07	-.3576E-01	-.4108E-01	-.2212E-06	0.1430E-02	-.3359E-01	-.1701E-01
ROW 24	HORZ:	-.9479E-06	0.9479E-06	0.1186E-05	0.5507E+00	0.7781E+00	0.8781E-03	0.9418E-03	0.1750E+01	0.7286E+00
	VERT:	-.9475E-07	-.9475E-07	-.5109E-08	-.4108E-01	-.1548E-01	0.1430E-02	-.2399E-04	-.1701E-01	-.3623E-02
ROW 23	HORZ:	-.9479E-06	0.9479E-06	0.1186E-05	0.5507E+00	0.7781E+00	0.8781E-03	0.9418E-03	0.3500E-03	0.7286E+00
	VERT:	-.3394E-06	-.3394E-06	-.8961E-07	-.1192E-01	-.3616E-01	-.7018E-06	0.1432E-02	0.2112E-02	-.4033E-01
ROW 22	HORZ:	-.8939E-06	0.8939E-06	0.1167E-05	0.5510E+00	0.7782E+00	0.5680E-03	0.7946E-03	0.8133E-03	0.6993E+00
	VERT:	-.8961E-07	-.8961E-07	-.1704E-08	-.3616E-01	-.4912E-01	0.1432E-02	0.2112E-02	-.2881E-04	-.2417E-02
ROW 21	HORZ:	-.8939E-06	0.8939E-06	0.1167E-05	0.1378E-05	0.7782E+00	0.5680E-03	0.7946E-03	0.8133E-03	0.6993E+00
	VERT:	-.3007E-06	-.3007E-06	-.8370E-07	-.5017E-07	-.5056E-01	-.1183E-05	0.1437E-02	0.2112E-02	-.1012E-01
ROW 20	HORZ:	-.8469E-06	0.8469E-06	0.1159E-05	0.1368E-05	0.7786E+00	0.2568E-03	0.6484E-03	0.1272E-02	0.6917E+00
	VERT:	-.8370E-07	-.8370E-07	-.5017E-07	-.7223E-08	-.8278E-01	0.1437E-02	0.2112E-02	-.7227E-05	-.3618E-03
ROW 19	HORZ:	-.8469E-06	0.8469E-06	0.1159E-05	0.1368E-05	0.7786E+00	0.1027E+01	0.6484E-03	0.1272E-02	0.1383E-03
	VERT:	-.2640E-06	-.2640E-06	-.7694E-07	-.4565E-07	-.1686E-01	-.4712E-01	-.2763E-06	0.2126E-02	0.2396E-02
ROW 18	HORZ:	-.8064E-06	0.8064E-06	0.1153E-05	0.1359E-05	0.7790E+00	0.1027E+01	0.1884E-03	0.1213E-02	0.4872E-03
	VERT:	-.7694E-07	-.7694E-07	-.4565E-07	-.2408E-08	-.4712E-01	-.1934E-01	0.2126E-02	0.2396E-02	0.7846E-03
ROW 17	HORZ:	-.8064E-06	0.8064E-06	0.1153E-05	0.1359E-05	0.1947E-05	0.1027E+01	0.7535E+00	0.1213E-02	0.4872E-03
	VERT:	-.2291E-06	-.2291E-06	-.6945E-07	-.4119E-07	-.8653E-07	-.6665E-01	-.2374E-01	-.1715E-06	0.2381E-02

ROW 16	HORZ:	-.7718E-06	0.7718E-06	0.1146E-05	0.1369E-05	0.1931E-05	0.1027E+01	0.7533E+00	0.6981E-03	0.8337E-03
	VERT:	-.6945E-07	-.6945E-07	-.4119E-07	-.8653E-07	-.9521E-08	-.2374E-01	-.1201E-01	0.2381E-02	0.7795E-03
ROW 15	HORZ:	-.7718E-06	0.7718E-06	0.1146E-05	0.1369E-05	0.1931E-05	0.1027E+01	0.7533E+00	0.6981E-03	0.8337E-03
	VERT:	-.1957E-06	-.1957E-06	-.6134E-07	-.3638E-07	-.7437E-07	-.2222E-01	-.2965E-01	-.6369E-06	0.2384E-02
ROW 14	HORZ:	-.7428E-06	0.7428E-06	0.1141E-05	0.1377E-05	0.1915E-05	0.1027E+01	0.7535E+00	0.1821E-03	0.1183E-02
	VERT:	-.6134E-07	-.6134E-07	-.3638E-07	-.7437E-07	-.3174E-08	-.2965E-01	-.4458E-01	0.2384E-02	0.7688E-03
ROW 13	HORZ:	-.7428E-06	0.7428E-06	0.1141E-05	0.1377E-05	0.1915E-05	0.2567E-05	0.7535E+00	0.7284E+00	0.1183E-02
	VERT:	-.1636E-06	-.1636E-06	-.5272E-07	-.3127E-07	-.6271E-07	-.7164E-07	-.4891E-01	-.3072E-01	-.1564E-06
ROW 12	HORZ:	-.7188E-06	0.7188E-06	0.1136E-05	0.1384E-05	0.1917E-05	0.2553E-05	0.7533E+00	0.7281E+00	0.1020E-02
	VERT:	-.5272E-07	-.5272E-07	-.3127E-07	-.6271E-07	-.7164E-07	-.6987E-08	-.3072E-01	-.1095E-01	0.7526E-03
ROW 11	HORZ:	-.7188E-06	0.7188E-06	0.1136E-05	0.1384E-05	0.1917E-05	0.2553E-05	0.7533E+00	0.7281E+00	0.1020E-02
	VERT:	-.1325E-06	-.1325E-06	-.4368E-07	-.2592E-07	-.5116E-07	-.5790E-07	-.1631E-01	-.3126E-01	-.6060E-06
ROW 10	HORZ:	-.6995E-06	0.6995E-06	0.1133E-05	0.1389E-05	0.1919E-05	0.2541E-05	0.7535E+00	0.7282E+00	0.8596E-03
	VERT:	-.4368E-07	-.4368E-07	-.2592E-07	-.5116E-07	-.5790E-07	-.2329E-08	-.3126E-01	-.4242E-01	0.7417E-03
ROW 9	HORZ:	-.6995E-06	0.6995E-06	0.1133E-05	0.1389E-05	0.1919E-05	0.2541E-05	0.1884E-05	0.7282E+00	0.8596E-03
	VERT:	-.1022E-06	-.1022E-06	-.3431E-07	-.2037E-07	-.3970E-07	-.4444E-07	0.4583E-07	-.4731E-01	-.1056E-05
ROW 8	HORZ:	-.6849E-06	0.6849E-06	0.1130E-05	0.1393E-05	0.1920E-05	0.2521E-05	0.1895E-05	0.7286E+00	0.7000E-03
	VERT:	-.3431E-07	-.3431E-07	-.2037E-07	-.3970E-07	-.4444E-07	0.4583E-07	-.6758E-08	-.7390E-01	0.7362E-03
ROW 7	HORZ:	-.6849E-06	0.6849E-06	0.1130E-05	0.1393E-05	0.1920E-05	0.2521E-05	0.1895E-05	0.7286E+00	0.2800E+01
	VERT:	-.7254E-07	-.7254E-07	-.2468E-07	-.1466E-07	-.2831E-07	-.3143E-07	0.3228E-07	-.1577E-01	-.2241E-01
ROW 6	HORZ:	-.6745E-06	0.6745E-06	0.1127E-05	0.1396E-05	0.1920E-05	0.2507E-05	0.1903E-05	0.7287E+00	0.2800E+01
	VERT:	-.2468E-07	-.2468E-07	-.1466E-07	-.2831E-07	-.3143E-07	0.3228E-07	-.2253E-08	-.2241E-01	0.3652E-03
ROW 5	HORZ:	-.6745E-06	0.6745E-06	0.1127E-05	0.1396E-05	0.1920E-05	0.2507E-05	0.1903E-05	0.1822E-05	0.7000E-05
	VERT:	-.4335E-07	-.4335E-07	-.1488E-07	-.8840E-08	-.1697E-07	-.1874E-07	0.1919E-07	0.1461E-08	-.1655E-06
ROW 4	HORZ:	-.6683E-06	0.6683E-06	0.1126E-05	0.1398E-05	0.1921E-05	0.2499E-05	0.1906E-05	0.1858E-05	0.6963E-05
	VERT:	-.1488E-07	-.1488E-07	-.8840E-08	-.1697E-07	-.1874E-07	0.1919E-07	0.1461E-08	-.1655E-06	0.1360E-08
ROW 3	HORZ:	-.6683E-06	0.6683E-06	0.1126E-05	0.1398E-05	0.1921E-05	0.2499E-05	0.1906E-05	0.1858E-05	0.6963E-05
	VERT:	-.1442E-07	-.1442E-07	-.4971E-08	-.2954E-08	-.5652E-08	-.6225E-08	0.6369E-08	0.4098E-09	-.5499E-07
ROW 2	HORZ:	-.6663E-06	0.6663E-06	0.1126E-05	0.1399E-05	0.1921E-05	0.2496E-05	0.1908E-05	0.1870E-05	0.6951E-05
	VERT:	-.4971E-08	-.4971E-08	-.2954E-08	-.5652E-08	-.6225E-08	0.6369E-08	0.4098E-09	-.5499E-07	0.3621E-09
ROW 1	HORZ:	-.6663E-06	0.6663E-06	0.1126E-05	0.1399E-05	0.1921E-05	0.2496E-05	0.1908E-05	0.1870E-05	0.6951E-05
	VERT:	0.4971E-08	0.4971E-08	0.2954E-08	0.5652E-08	0.6225E-08	-.6369E-08	-.4098E-09	0.5499E-07	-.3621E-09

COLUMN:	10	11	12	13	14	15	16	17	18
ROW 33 HORZ:	0.6012E+00	0.1443E+01	0.1443E+01	0.1443E+01	0.1443E+01	0.1443E+01	0.1443E+01	0.1443E+01	0.1443E+01
VERT:	-.4336E-02	-.8000E-01	-.1383E-01	-.2803E-02	-.5822E-03	-.1226E-03	-.3155E-04	-.3595E-04	-.1474E-03
ROW 32 HORZ:	0.6596E+00	0.1392E+01	0.1434E+01	0.1441E+01	0.1442E+01	0.1443E+01	0.1443E+01	0.1443E+01	0.1443E+01
VERT:	-.8000E-01	-.1383E-01	-.2803E-02	-.5822E-03	-.1226E-03	-.3155E-04	-.3595E-04	-.1474E-03	-.7038E-03

ROW 31	HORZ:	0.6596E+00	0.1392E+01	0.1434E+01	0.1441E+01	0.1442E+01	0.1443E+01	0.1443E+01	0.1443E+01	0.1443E+01
	VERT:	-.4418E-02	-.6416E-01	-.1290E-01	-.2656E-02	-.5530E-03	-.1162E-0	-.2995E-04	-.3416E-04	-.1397E-03
ROW 30	HORZ:	0.7058E+00	0.1352E+01	0.1426E+01	0.1439E+01	0.1442E+01	0.1443E+01	0.1443E+01	0.1443E+01	0.1444E+01
	VERT:	-.6416E-01	-.1290E-01	-.2656E-02	-.5530E-03	-.1162E-03	-.2995E-04	-.3416E-04	-.1397E-03	-.6653E-03
ROW 29	HORZ:	0.7058E+00	0.1352E+01	0.1426E+01	0.1439E+01	0.1442E+01	0.1443E+01	0.1443E+01	0.1443E+01	0.1444E+01
	VERT:	-.4436E-02	-.5017E-01	-.1130E-01	-.2372E-02	-.4957E-03	-.1044E-03	-.2660E-04	-.3067E-04	-.1253E-03
ROW 28	HORZ:	0.7412E+00	0.1322E+01	0.1419E+01	0.1438E+01	0.1442E+01	0.1443E+01	0.1443E+01	0.1443E+01	0.1444E+01
	VERT:	-.5017E-01	-.1130E-01	-.2372E-02	-.4957E-03	-.1044E-03	-.2660E-04	-.3067E-04	-.1253E-03	-.5938E-03
ROW 27	HORZ:	0.7412E+00	0.1322E+01	0.1419E+01	0.1438E+01	0.1442E+01	0.1443E+01	0.1443E+01	0.1443E+01	0.1444E+01
	VERT:	-.4230E-02	-.3760E-01	-.9186E-02	-.1971E-02	-.4135E-03	-.8717E-04	-.2236E-04	-.2543E-04	-.1045E-03
ROW 26	HORZ:	0.7670E+00	0.1300E+01	0.1414E+01	0.1437E+01	0.1442E+01	0.1443E+01	0.1443E+01	0.1443E+01	0.1444E+01
	VERT:	-.3760E-01	-.9186E-02	-.1971E-02	-.4135E-03	-.8717E-04	-.2236E-04	-.2543E-04	-.1045E-03	-.4956E-03
ROW 25	HORZ:	0.7670E+00	0.1300E+01	0.1414E+01	0.1437E+01	0.1442E+01	0.1443E+01	0.1443E+01	0.1443E+01	0.1444E+01
	VERT:	-.3623E-02	-.2607E-01	-.6721E-02	-.1475E-02	-.3108E-03	-.6504E-04	-.1722E-04	-.1892E-04	-.7860E-04
ROW 24	HORZ:	0.7843E+00	0.1285E+01	0.1410E+01	0.1436E+01	0.1441E+01	0.1443E+01	0.1443E+01	0.1443E+01	0.1445E+01
	VERT:	-.2607E-01	-.6721E-02	-.1475E-02	-.3108E-03	-.6504E-04	-.1722E-04	-.1892E-04	-.7860E-04	-.3728E-03
ROW 23	HORZ:	0.7843E+00	0.1285E+01	0.1410E+01	0.1436E+01	0.1441E+01	0.1443E+01	0.1443E+01	0.1443E+01	0.1445E+01
	VERT:	-.2417E-02	-.1523E-01	-.4021E-02	-.9107E-03	-.1926E-03	-.4033E-04	-.1054E-04	-.1168E-04	-.4873E-04
ROW 22	HORZ:	0.7942E+00	0.1276E+01	0.1407E+01	0.1435E+01	0.1441E+01	0.1442E+01	0.1443E+01	0.1443E+01	0.1445E+01
	VERT:	-.1523E-01	-.4021E-02	-.9107E-03	-.1926E-03	-.4033E-04	-.1054E-04	-.1168E-04	-.4873E-04	-.2314E-03
ROW 21	HORZ:	0.7942E+00	0.1276E+01	0.1407E+01	0.1435E+01	0.1441E+01	0.1442E+01	0.1443E+01	0.1443E+01	0.1445E+01
	VERT:	-.3618E-03	-.4793E-02	-.1186E-02	-.3061E-03	-.6507E-04	-.1356E-04	-.3335E-05	-.3837E-05	-.1643E-04
ROW 20	HORZ:	0.7976E+00	0.1274E+01	0.1407E+01	0.1435E+01	0.1441E+01	0.1442E+01	0.1443E+01	0.1443E+01	0.1445E+01
	VERT:	-.4793E-02	-.1186E-02	-.3061E-03	-.6507E-04	-.1356E-04	-.3335E-05	-.3837E-05	-.1643E-04	-.7840E-04
ROW 19	HORZ:	0.1595E-03	0.2547E-03	0.2813E-03	0.2870E-03	0.2882E-03	0.2885E-03	0.2886E-03	0.2886E-03	0.2889E-03
	VERT:	0.7846E-03	0.3580E-03	0.2550E-03	0.1176E-05	0.5612E-06	0.2883E-06	0.2363E-06	0.1864E-06	0.1341E-06
ROW 18	HORZ:	0.2518E-03	0.2770E-03	0.3363E-03	0.2872E-03	0.2883E-03	0.2885E-03	0.2886E-03	0.2886E-03	0.2890E-03
	VERT:	0.3580E-03	0.2550E-03	0.1176E-05	0.5612E-06	0.2883E-06	0.2363E-06	0.1864E-06	0.1341E-06	0.7219E-07
ROW 17	HORZ:	0.2518E-03	0.2770E-03	0.3363E-05	0.2872E-05	0.2883E-05	0.2885E-05	0.2886E-05	0.2886E-05	0.2890E-05
	VERT:	0.7795E-03	0.3586E-03	0.5048E-05	0.6440E-05	0.5735E-05	0.2906E-05	0.2370E-05	0.1872E-05	0.1374E-05
ROW 16	HORZ:	0.3429E-03	0.2454E-03	0.3062E-05	0.3024E-05	0.3495E-05	0.3001E-05	0.2994E-05	0.2994E-05	0.2997E-05
	VERT:	0.3586E-03	0.5048E-03	0.6440E-05	0.5735E-05	0.2906E-05	0.2370E-05	0.1872E-05	0.1374E-05	0.8800E-06
ROW 15	HORZ:	0.3429E-03	0.2454E-03	0.3062E-05	0.3024E-05	0.3495E-05	0.3001E-05	0.2994E-05	0.2994E-05	0.2997E-05
	VERT:	0.7688E-03	0.3565E-03	0.4942E-05	0.6439E-05	0.5745E-05	0.2895E-05	0.2370E-05	0.1872E-05	0.1375E-05
ROW 14	HORZ:	0.4322E-03	0.2156E-03	0.2738E-05	0.3174E-05	0.4112E-05	0.3115E-05	0.3101E-05	0.3102E-05	0.3104E-05
	VERT:	0.3565E-03	0.4942E-03	0.6439E-05	0.5745E-05	0.2895E-05	0.2370E-05	0.1872E-05	0.1375E-05	0.8802E-06
ROW 13	HORZ:	0.4322E-03	0.2156E-03	0.2738E-05	0.3174E-05	0.4112E-05	0.3115E-05	0.3101E-05	0.3102E-05	0.3104E-05
	VERT:	0.7526E-03	0.3518E-03	0.4849E-05	0.6448E-05	0.5765E-05	0.2873E-05	0.2369E-05	0.1872E-05	0.1375E-05

ROW 12	HORZ:	0.5189E-03	0.1868E-03	0.2391E-05	0.3322E-05	0.4738E-05	0.3224E-05	0.3209E-05	0.3209E-05	0.3210E-05
	VERT:	0.3518E-03	0.4849E-03	0.6448E-05	0.5765E-05	0.2873E-05	0.2369E-05	0.1872E-05	0.1375E-05	0.8804E-06
ROW 11	HORZ:	0.5189E-03	0.1868E-03	0.2391E-03	0.3322E-03	0.4738E-05	0.3224E-05	0.3209E-05	0.3209E-05	0.3210E-05
	VERT:	0.7417E-03	0.3446E-03	0.2412E-03	0.1653E-05	-.6017E-07	0.2841E-05	0.2369E-05	0.1872E-05	0.1375E-05
ROW 10	HORZ:	0.6049E-03	0.2092E-03	0.2910E-03	0.3339E-03	0.4110E-05	0.3326E-05	0.3317E-05	0.3317E-05	0.3317E-05
	VERT:	0.3446E-03	0.2412E-03	0.1653E-05	-.6017E-05	0.2841E-05	0.2369E-05	0.1872E-05	0.1375E-05	0.8806E-06
ROW 9	HORZ:	0.6049E-03	0.2092E-03	0.2910E-03	0.3339E-03	0.4110E-05	0.3326E-05	0.3317E-05	0.3317E-05	0.3317E-05
	VERT:	0.7362E-03	0.3360E-03	0.2430E-03	0.2580E-05	-.2044E-06	0.2824E-05	0.2369E-05	0.1872E-05	0.1375E-05
ROW 8	HORZ:	0.6915E-03	0.2293E-03	0.3430E-03	0.3388E-03	0.3455E-05	0.3424E-05	0.3424E-05	0.3424E-05	0.3424E-05
	VERT:	0.3360E-03	0.2430E-03	0.2580E-05	-.2044E-04	0.2824E-05	0.2369E-05	0.1872E-05	0.1375E-05	0.8807E-06
ROW 7	HORZ:	0.2766E+01	0.9172E+00	0.3430E-03	0.3388E-03	0.3455E-03	0.3424E-03	0.3424E-03	0.3424E-03	0.3424E-03
	VERT:	0.3652E-03	-.1967E-01	-.2765E-06	0.2490E-05	-.1382E-04	0.2493E-06	0.2368E-06	0.1871E-06	0.1374E-06
ROW 6	HORZ:	0.2766E+01	0.9172E+00	0.3424E-03	0.3424E-03	0.3424E-03	0.3424E-03	0.3424E-03	0.3424E-03	0.3424E-03
	VERT:	-.1967E-01	-.1935E-01	0.2490E-05	-.1382E-04	0.2493E-06	0.2368E-06	0.1871E-06	0.1374E-06	0.8806E-07
ROW 5	HORZ:	0.6915E-05	0.9172E+00	0.1370E+01	0.1369E+01	0.1370E+01	0.1370E+01	0.1370E+01	0.1370E+01	0.1370E+01
	VERT:	0.1360E-08	-.5951E-01	-.1470E-01	0.1125E-06	-.1025E-04	0.1857E-06	0.1776E-06	0.1261E-06	0.8882E-07
ROW 4	HORZ:	0.6917E-05	0.9166E+00	0.1369E+01	0.1369E+01	0.1370E+01	0.1370E+01	0.1370E+01	0.1370E+01	0.1370E+01
	VERT:	-.8501E-08	-.1470E-01	0.1125E-06	-.1025E-04	0.1857E-06	0.1776E-06	0.1261E-06	0.8882E-07	0.6604E-07
ROW 3	HORZ:	0.6917E-05	0.9166E+00	0.1369E+01	0.1369E+01	0.1370E+01	0.1370E+01	0.1370E+01	0.1370E+01	0.1370E+01
	VERT:	0.3621E-09	-.1983E-01	-.4902E-02	-.4760E-06	-.3339E-05	0.6161E-07	0.5921E-07	0.3253E-07	0.2010E-07
ROW 2	HORZ:	0.6918E-05	0.9165E+00	0.1369E+01	0.1369E+01	0.1370E+01	0.1370E+01	0.1370E+01	0.1370E+01	0.1370E+01
	VERT:	-.2833E-08	-.4902E-02	-.4760E-06	-.3339E-05	0.6161E-07	0.5921E-07	0.3253E-07	0.2010E-07	0.2201E-07
ROW 1	HORZ:	0.6918E-05	0.9165E+00	0.1369E+01	0.1369E+01	0.1370E+01	0.1370E+01	0.1370E+01	0.1370E+01	0.1370E+01
	VERT:	0.2833E-08	0.4902E-02	0.4760E-06	0.3339E-05	-.6161E-07	-.5921E-07	-.3253E-07	-.2010E-07	-.2201E-07

	COLUMN:	19	20	21	22	23	24	25	26	27
ROW 33	HORZ:	0.1443E+01	0.1443E+01	0.1443E+01	0.2405E+01	0.2405E+01	0.2407E+01	0.2400E+01	0.2400E+01	0.2400E+01
	VERT:	-.7038E-03	-.3356E-02	-.1648E-01	-.9387E-01	-.1649E-01	-.3462E-02	-.7909E-04	0.1543E-05	-.2994E-06
ROW 32	HORZ:	0.1445E+01	0.1453E+01	0.1503E+01	0.2345E+01	0.2395E+01	0.2404E+01	0.2400E+01	0.2400E+01	0.2400E+01
	VERT:	-.3356E-02	-.1648E-01	-.9387E-01	-.1649E-01	-.3462E-02	-.7909E-04	0.1543E-05	-.2994E-06	-.2398E-06
ROW 31	HORZ:	0.1445E+01	0.1453E+01	0.1503E+01	0.2345E+01	0.2395E+01	0.2404E+01	0.2400E+01	0.2400E+01	0.2400E+01
	VERT:	-.6653E-03	-.3183E-02	-.1541E-01	-.7564E-01	-.1543E-01	-.3244E-02	-.1756E-03	-.3870E-06	-.9300E-06
ROW 30	HORZ:	0.1447E+01	0.1462E+01	0.1549E+01	0.2298E+01	0.2385E+01	0.2402E+01	0.2400E+01	0.2400E+01	0.2400E+01
	VERT:	-.3183E-02	-.1541E-01	-.7564E-01	-.1543E-01	-.3244E-02	-.1756E-03	-.3870E-06	-.9300E-06	-.7227E-06
ROW 29	HORZ:	0.1447E+01	0.1462E+01	0.1549E+01	0.2298E+01	0.2385E+01	0.2402E+01	0.2400E+01	0.2400E+01	0.2400E+01
	VERT:	-.5938E-03	-.2848E-02	-.1353E-01	-.5943E-01	-.1355E-01	-.2874E-02	-.2174E-03	-.5770E-05	-.7967E-05
ROW 28	HORZ:	0.1449E+01	0.1471E+01	0.1585E+01	0.2263E+01	0.2377E+01	0.2400E+01	0.2400E+01	0.2400E+01	0.2400E+01
	VERT:	-.2848E-02	-.1353E-01	-.5943E-01	-.1355E-01	-.2874E-02	-.2174E-03	-.5770E-05	-.7967E-05	0.5179E-05

ROW 27	HORZ:	0.1449E+01	0.1471E+01	0.1585E+01	0.2263E+01	0.2377E+01	0.2400E+01	0.2400E+01	0.2400E+01	0.2400E+01
	VERT:	-.4956E-03	-.2368E-02	-.1106E-01	-.4475E-01	-.1107E-01	-.2389E-02	-.2119E-03	-.1397E-04	-.2470E-05
ROW 26	HORZ:	0.1450E+01	0.1477E+01	0.1611E+01	0.2237E+01	0.2370E+01	0.2398E+01	0.2400E+01	0.2400E+01	0.2400E+01
	VERT:	-.2368E-02	-.1106E-01	-.4475E-01	-.1107E-01	-.2389E-02	-.2119E-03	-.1397E-04	-.2470E-05	0.4985E-05
ROW 25	HORZ:	0.1450E+01	0.1477E+01	0.1611E+01	0.2237E+01	0.2370E+01	0.2398E+01	0.2400E+01	0.2400E+01	0.2400E+01
	VERT:	-.3728E-03	-.1775E-02	-.8174E-02	-.3121E-01	-.8177E-02	-.1792E-02	-.1760E-03	-.1905E-04	0.3094E-05
ROW 24	HORZ:	0.1451E+01	0.1482E+01	0.1628E+01	0.2219E+01	0.2365E+01	0.2397E+01	0.2400E+01	0.2400E+01	0.2400E+01
	VERT:	-.1775E-02	-.8174E-02	-.3121E-01	-.8177E-02	-.1792E-02	-.1760E-03	-.1905E-04	0.3094E-05	0.5103E-05
ROW 23	HORZ:	0.1451E+01	0.1482E+01	0.1628E+01	0.2219E+01	0.2365E+01	0.2397E+01	0.2400E+01	0.2400E+01	0.2400E+01
	VERT:	-.2314E-03	-.1099E-02	-.5010E-02	-.1843E-01	-.5012E-02	-.1102E-02	-.1217E-03	-.1309E-04	-.5792E-05
ROW 22	HORZ:	0.1452E+01	0.1485E+01	0.1639E+01	0.2209E+01	0.2362E+01	0.2396E+01	0.2400E+01	0.2400E+01	0.2400E+01
	VERT:	-.1099E-02	-.5010E-02	-.1843E-01	-.5012E-02	-.1102E-02	-.1217E-03	-.1309E-04	-.5792E-05	0.5552E-05
ROW 21	HORZ:	0.1452E+01	0.1485E+01	0.1639E+01	0.2209E+01	0.2362E+01	0.2396E+01	0.2400E+01	0.2400E+01	0.2400E+01
	VERT:	-.7840E-04	-.3722E-03	-.1688E-02	-.6095E-02	-.1688E-02	-.3658E-03	-.5011E-04	-.5428E-05	-.5156E-05
ROW 20	HORZ:	0.1452E+01	0.1486E+01	0.1642E+01	0.2205E+01	0.2361E+01	0.2396E+01	0.2399E+01	0.2400E+01	0.2400E+01
	VERT:	-.3722E-03	-.1688E-02	-.6095E-02	-.1688E-02	-.3658E-03	-.5011E-04	-.5428E-05	-.5156E-05	-.1298E-05
ROW 19	HORZ:	0.2904E-03	0.2973E-03	0.3285E-03	0.4410E-03	0.4722E-03	0.2396E-05	0.4799E-03	0.4800E-03	0.4799E-03
	VERT:	0.7219E-07	-.3517E-07	-.3417E-06	-.1233E-05	-.2398E-06	0.5212E-07	-.1408E-04	-.2425E-05	-.2271E-05
ROW 18	HORZ:	0.2904E-03	0.2973E-03	0.3286E-03	0.4408E-03	0.4699E-03	0.2422E-05	0.4774E-03	0.4799E-03	0.4799E-03
	VERT:	-.3517E-07	-.3417E-06	-.1233E-05	-.2398E-06	0.1042E-04	-.7038E-07	-.2425E-05	-.2271E-05	-.2144E-05
ROW 17	HORZ:	0.2904E-05	0.2973E-05	0.3286E-05	0.4408E-05	0.4699E-05	0.2422E-05	0.4774E-05	0.4799E-05	0.4799E-05
	VERT:	0.8800E-06	0.3979E-06	-.2530E-07	-.1733E-06	0.7539E-06	0.8640E-06	-.2501E-04	-.2398E-04	-.2271E-04
ROW 16	HORZ:	0.3008E-05	0.3065E-05	0.3318E-05	0.4208E-05	0.4489E-05	0.5316E-05	0.4550E-05	0.4525E-05	0.4524E-05
	VERT:	0.3979E-06	-.2530E-07	-.1733E-06	0.7539E-06	0.1728E-05	-.1250E-04	-.2398E-04	-.2271E-04	-.2144E-04
ROW 15	HORZ:	0.3008E-05	0.3065E-05	0.3318E-05	0.4208E-05	0.4489E-05	0.5316E-05	0.4550E-05	0.4525E-05	0.4524E-05
	VERT:	0.8802E-06	0.3991E-06	-.1981E-07	-.1540E-06	0.7599E-06	0.8759E-06	-.2503E-04	-.2398E-04	-.2271E-04
ROW 14	HORZ:	0.3113E-05	0.3156E-05	0.3348E-05	0.4010E-05	0.4274E-05	0.8214E-05	0.4321E-05	0.4250E-05	0.4250E-05
	VERT:	0.3991E-06	-.1981E-07	-.1540E-06	0.7599E-06	0.1752E-05	-.1252E-04	-.2398E-04	-.2271E-04	-.2144E-04
ROW 13	HORZ:	0.3113E-05	0.3156E-05	0.3348E-05	0.4010E-05	0.4274E-05	0.8214E-05	0.4321E-05	0.4250E-05	0.4250E-05
	VERT:	0.8804E-06	0.4000E-06	-.1566E-07	-.1397E-06	0.7656E-06	0.9328E-06	-.2514E-04	-.2398E-04	-.2271E-04
ROW 12	HORZ:	0.3217E-05	0.3246E-05	0.3374E-05	0.3814E-05	0.4036E-05	0.1114E-04	0.4069E-05	0.3976E-05	0.3975E-05
	VERT:	0.4000E-06	-.1566E-07	-.1397E-06	0.7656E-06	0.1866E-05	-.1257E-04	-.2398E-04	-.2271E-04	-.2144E-04
ROW 11	HORZ:	0.3217E-05	0.3246E-05	0.3374E-05	0.3814E-05	0.4036E-05	0.1114E-04	0.4069E-05	0.3976E-05	0.3975E-05
	VERT:	0.8806E-06	0.4006E-06	-.1287E-07	-.1302E-06	0.7704E-06	0.1035E-05	-.2535E-04	-.2398E-04	-.2271E-04
ROW 10	HORZ:	0.3320E-05	0.3335E-05	0.3400E-05	0.3619E-05	0.3755E-05	0.1410E-04	0.3772E-05	0.3700E-05	0.3700E-05
	VERT:	0.4006E-06	-.1287E-07	-.1302E-06	0.7704E-06	0.2070E-05	-.1267E-04	-.2398E-04	-.2271E-04	-.2144E-04
ROW 9	HORZ:	0.3320E-05	0.3335E-05	0.3400E-05	0.3619E-05	0.3755E-05	0.1410E-04	0.3772E-05	0.3700E-05	0.3700E-05
	VERT:	0.8807E-06	0.4010E-06	-.1147E-07	-.1254E-06	0.7734E-06	0.1185E-05	-.2565E-04	-.2398E-04	-.2271E-04

ROW 8	HORZ:	0.3424E-05	0.3424E-05	0.3424E-05	0.3425E-05	0.3409E-05	0.1714E-04	0.3412E-05	0.3425E-05	0.3425E-05
	VERT:	0.4010E-06	-.1147E-07	-.1254E-06	0.7734E-06	0.2369E-05	-.1282E-04	-.2398E-04	-.2271E-04	-.2144E-04
ROW 7	HORZ:	0.3424E-03	0.3424E-03	0.3424E-03	0.3425E-03	0.3409E-03	0.1714E-04	0.3412E-03	0.3425E-03	0.3425E-03
	VERT:	0.8806E-07	0.4005E-07	-.9355E-09	-.1243E-07	0.6067E-07	-.3476E-07	0.3468E-05	-.2384E-05	-.2271E-05
ROW 6	HORZ:	0.3424E-03	0.3424E-03	0.3424E-03	0.3424E-03	0.3424E-03	0.1712E-04	0.3425E-03	0.3425E-03	0.3425E-03
	VERT:	0.4005E-07	-.9355E-09	-.1243E-07	0.6067E-07	-.6953E-05	0.1734E-07	-.2384E-05	-.2271E-05	-.2144E-05
ROW 5	HORZ:	0.1370E+01	0.1370E+01	0.1370E+01	0.1370E+01	0.1370E+01	0.1370E+02	0.1370E+01	0.1370E+01	0.1370E+01
	VERT:	0.6604E-07	0.2998E-07	-.1146E-06	0.1046E-06	0.4427E-07	-.1064E-05	0.8276E-05	-.1901E-05	-.1703E-05
ROW 4	HORZ:	0.1370E+01	0.1370E+01	0.1370E+01	0.1370E+01	0.1370E+01	0.1370E+02	0.1370E+01	0.1370E+01	0.1370E+01
	VERT:	0.2998E-07	-.1146E-06	0.1046E-06	0.4427E-07	-.1064E-04	0.8276E-06	-.1901E-05	-.1703E-05	-.1608E-05
ROW 3	HORZ:	0.1370E+01	0.1370E+01	0.1370E+01	0.1370E+01	0.1370E+01	0.1370E+02	0.1370E+01	0.1370E+01	0.1370E+01
	VERT:	0.2201E-07	0.9980E-08	-.1142E-06	0.1109E-06	0.1444E-07	-.3545E-06	0.2908E-05	-.7093E-06	-.5676E-06
ROW 2	HORZ:	0.1370E+01	0.1370E+01	0.1370E+01	0.1370E+01	0.1370E+01	0.1370E+02	0.1370E+01	0.1370E+01	0.1370E+01
	VERT:	0.9980E-08	-.1142E-06	0.1109E-06	0.1444E-07	-.3545E-05	0.2908E-06	-.7093E-06	-.5676E-06	-.5359E-06
ROW 1	HORZ:	0.1370E+01	0.1370E+01	0.1370E+01	0.1370E+01	0.1370E+01	0.1370E+02	0.1370E+01	0.1370E+01	0.1370E+01
	VERT:	-.9980E-08	0.1142E-06	-.1109E-06	-.1444E-07	0.3545E-05	-.2908E-06	0.7093E-06	0.5676E-06	0.5359E-06

COLUMN:	28	29	30	31	32	33	34	35	36
ROW 33 HORZ:	0.2400E+01	0.2400E+01	0.2400E+01	0.2400E+01	0.2400E+01	0.2400E+01	0.2400E+01	0.2400E+01	0.2399E+01
VERT:	-.2398E-06	0.1349E-07	-.2605E-07	-.4170E-07	-.1195E-05	-.4348E-05	0.5118E-05	-.3624E-06	-.2729E-05
ROW 32 HORZ:	0.2400E+01	0.2400E+01	0.2400E+01	0.2400E+01	0.2400E+01	0.2400E+01	0.2400E+01	0.2400E+01	0.2399E+01
VERT:	0.1349E-07	-.2605E-07	-.4170E-07	-.1195E-05	-.4348E-05	0.5118E-05	-.3624E-06	-.2729E-05	-.3317E-04
ROW 31 HORZ:	0.2400E+01	0.2400E+01	0.2400E+01	0.2400E+01	0.2400E+01	0.2400E+01	0.2400E+01	0.2400E+01	0.2399E+01
VERT:	-.7227E-06	0.4536E-07	-.6472E-05	0.6287E-05	-.3552E-05	-.6861E-05	0.9208E-05	-.1139E-05	-.7717E-05
ROW 30 HORZ:	0.2400E+01	0.2400E+01	0.2400E+01	0.2400E+01	0.2400E+01	0.2400E+01	0.2400E+01	0.2400E+01	0.2400E+01
VERT:	0.4536E-07	-.6472E-05	0.6287E-05	-.3552E-05	-.6861E-05	0.9208E-05	-.1139E-05	-.7717E-05	-.1013E-03
ROW 29 HORZ:	0.2400E+01	0.2400E+01	0.2400E+01	0.2400E+01	0.2400E+01	0.2400E+01	0.2400E+01	0.2400E+01	0.2400E+01
VERT:	0.5179E-05	0.1991E-06	-.6842E-05	0.2044E-06	0.3748E-06	-.3306E-05	0.9561E-06	0.4414E-05	-.1125E-04
ROW 28 HORZ:	0.2400E+01	0.2400E+01	0.2400E+01	0.2400E+01	0.2400E+01	0.2400E+01	0.2400E+01	0.2400E+01	0.2400E+01
VERT:	0.1991E-06	-.6842E-05	0.2044E-06	0.3748E-06	-.3306E-05	0.9561E-06	0.4414E-05	-.1125E-04	-.1497E-03
ROW 27 HORZ:	0.2400E+01	0.2400E+01	0.2400E+01	0.2400E+01	0.2400E+01	0.2400E+01	0.2400E+01	0.2400E+01	0.2400E+01
VERT:	0.4985E-05	-.6006E-05	0.5336E-05	-.1216E-04	0.4366E-05	0.1163E-06	-.7283E-05	0.1029E-04	-.1912E-04
ROW 26 HORZ:	0.2400E+01	0.2400E+01	0.2400E+01	0.2400E+01	0.2400E+01	0.2400E+01	0.2400E+01	0.2400E+01	0.2400E+01
VERT:	-.6006E-05	0.5336E-05	-.1216E-04	0.4366E-05	0.1163E-06	-.7283E-05	0.1029E-04	-.1912E-04	-.1643E-03
ROW 25 HORZ:	0.2400E+01	0.2400E+01	0.2400E+01	0.2400E+01	0.2400E+01	0.2400E+01	0.2400E+01	0.2400E+01	0.2400E+01
VERT:	0.5103E-05	-.1258E-04	0.1160E-04	-.1230E-04	0.2312E-05	-.2802E-05	0.3242E-05	-.2236E-05	-.1227E-04
ROW 24 HORZ:	0.2400E+01	0.2400E+01	0.2400E+01	0.2400E+01	0.2400E+01	0.2400E+01	0.2400E+01	0.2400E+01	0.2400E+01
VERT:	-.1258E-04	0.1160E-04	-.1230E-04	0.2312E-05	-.2802E-05	0.3242E-05	-.2236E-05	-.1227E-04	-.1705E-03

ROW 23	HORZ:	0.2400E+01	0.2400E+01	0.2400E+01	0.2400E+01	0.2400E+01	0.2400E+01	0.2400E+01	0.2400E+01	0.2400E+01
	VERT:	0.5552E-05	-.6806E-06	-.5133E-06	-.6688E-05	0.5875E-06	-.5906E-05	0.7568E-05	-.1894E-05	-.9334E-05
ROW 22	HORZ:	0.2400E+01	0.2400E+01	0.2400E+01	0.2400E+01	0.2400E+01	0.2400E+01	0.2400E+01	0.2400E+01	0.2400E+01
	VERT:	-.6806E-06	-.5133E-06	-.6688E-05	0.5875E-06	-.5906E-05	0.7568E-05	-.1894E-05	-.9334E-05	-.1476E-03
ROW 21	HORZ:	0.2400E+01	0.2400E+01	0.2400E+01	0.2400E+01	0.2400E+01	0.2400E+01	0.2400E+01	0.2400E+01	0.2400E+01
	VERT:	-.1298E-05	0.4722E-05	-.7326E-05	-.1304E-05	-.9065E-06	-.2952E-05	-.5136E-06	0.4810E-05	-.1061E-04
ROW 20	HORZ:	0.2400E+01	0.2400E+01	0.2400E+01	0.2400E+01	0.2400E+01	0.2400E+01	0.2400E+01	0.2400E+01	0.2400E+01
	VERT:	0.4722E-05	-.7326E-05	-.1304E-05	-.9065E-06	-.2952E-05	-.5136E-06	0.4810E-05	-.1061E-04	-.7913E-04
ROW 19	HORZ:	0.4800E-03	0.4799E-03	0.4800E-03	0.4799E-03	0.4799E-03	0.4800E-03	0.4799E-03	0.4799E-03	0.4800E-03
	VERT:	-.2144E-05	-.2017E-05	-.1891E-05	-.1762E-05	-.1635E-05	-.1511E-05	-.1382E-05	-.1255E-05	-.1207E-05
ROW 18	HORZ:	0.4799E-03	0.4799E-03	0.4799E-03	0.4799E-03	0.4799E-03	0.4799E-03	0.4799E-03	0.4799E-03	0.4876E-03
	VERT:	-.2017E-05	-.1891E-05	-.1762E-05	-.1635E-05	-.1511E-05	-.1382E-05	-.1255E-05	-.1207E-05	-.3623E-04
ROW 17	HORZ:	0.4799E-05	0.4799E-05	0.4799E-05	0.4799E-05	0.4799E-05	0.4799E-05	0.4799E-05	0.4799E-05	0.4876E-05
	VERT:	-.2144E-04	-.2017E-04	-.1890E-04	-.1763E-04	-.1636E-04	-.1509E-04	-.1382E-04	-.1255E-04	-.1124E-04
ROW 16	HORZ:	0.4524E-05	0.4524E-05	0.4524E-05	0.4524E-05	0.4524E-05	0.4525E-05	0.4524E-05	0.4516E-05	0.2567E-05
	VERT:	-.2017E-04	-.1890E-04	-.1763E-04	-.1636E-04	-.1509E-04	-.1382E-04	-.1255E-04	-.1124E-04	-.5740E-06
ROW 15	HORZ:	0.4524E-05	0.4524E-05	0.4524E-05	0.4524E-05	0.4524E-05	0.4525E-05	0.4524E-05	0.4516E-05	0.2567E-05
	VERT:	-.2144E-04	-.2017E-04	-.1890E-04	-.1763E-04	-.1636E-04	-.1509E-04	-.1382E-04	-.1255E-04	-.1128E-04
ROW 14	HORZ:	0.4250E-05	0.4250E-05	0.4250E-05	0.4250E-05	0.4250E-05	0.4250E-05	0.4250E-05	0.4242E-05	0.1842E-06
	VERT:	-.2017E-04	-.1890E-04	-.1763E-04	-.1636E-04	-.1509E-04	-.1382E-04	-.1255E-04	-.1128E-04	-.2728E-06
ROW 13	HORZ:	0.4250E-05	0.4250E-05	0.4250E-05	0.4250E-05	0.4250E-05	0.4250E-05	0.4250E-05	0.4242E-05	0.1842E-06
	VERT:	-.2144E-04	-.2017E-04	-.1890E-04	-.1763E-04	-.1636E-04	-.1509E-04	-.1382E-04	-.1255E-04	-.1137E-04
ROW 12	HORZ:	0.3975E-05	0.3975E-05	0.3975E-05	0.3975E-05	0.3975E-05	0.3975E-05	0.3975E-05	0.3986E-05	0.8265E-05
	VERT:	-.2017E-04	-.1890E-04	-.1763E-04	-.1636E-04	-.1509E-04	-.1382E-04	-.1255E-04	-.1137E-04	-.4871E-04
ROW 11	HORZ:	0.3975E-05	0.3975E-05	0.3975E-05	0.3975E-05	0.3975E-05	0.3975E-05	0.3975E-05	0.3986E-05	0.8265E-05
	VERT:	-.2144E-04	-.2017E-04	-.1890E-04	-.1763E-04	-.1636E-04	-.1509E-04	-.1382E-04	-.1255E-04	-.1128E-04
ROW 10	HORZ:	0.3700E-05	0.3700E-05	0.3700E-05	0.3700E-05	0.3700E-05	0.3700E-05	0.3700E-05	0.3711E-05	0.5845E-05
	VERT:	-.2017E-04	-.1890E-04	-.1763E-04	-.1636E-04	-.1509E-04	-.1382E-04	-.1255E-04	-.1128E-04	-.9853E-07
ROW 9	HORZ:	0.3700E-05	0.3700E-05	0.3700E-05	0.3700E-05	0.3700E-05	0.3700E-05	0.3700E-05	0.3711E-05	0.5845E-05
	VERT:	-.2144E-04	-.2017E-04	-.1890E-04	-.1763E-04	-.1636E-04	-.1509E-04	-.1382E-04	-.1255E-04	-.1123E-04
ROW 8	HORZ:	0.3425E-05	0.3425E-05	0.3425E-05	0.3425E-05	0.3426E-05	0.3426E-05	0.3426E-05	0.3426E-05	0.3425E-05
	VERT:	-.2017E-04	-.1890E-04	-.1763E-04	-.1636E-04	-.1509E-04	-.1382E-04	-.1255E-04	-.1123E-04	-.5038E-07
ROW 7	HORZ:	0.3425E-03	0.3425E-03	0.3425E-03	0.3425E-03	0.3426E-03	0.3426E-03	0.3426E-03	0.3426E-03	0.3425E-03
	VERT:	-.2144E-05	-.2017E-05	-.1890E-05	-.1763E-05	-.1636E-05	-.1509E-05	-.1382E-05	-.1255E-05	-.1124E-05
ROW 6	HORZ:	0.3425E-03	0.3425E-03	0.3425E-03	0.3425E-03	0.3425E-03	0.3425E-03	0.3425E-03	0.3426E-03	0.3426E-03
	VERT:	-.2017E-05	-.1890E-05	-.1763E-05	-.1636E-05	-.1509E-05	-.1382E-05	-.1255E-05	-.1124E-05	-.1310E-05
ROW 5	HORZ:	0.1370E+01	0.1370E+01	0.1370E+01	0.1370E+01	0.1370E+01	0.1370E+01	0.1370E+01	0.1370E+01	0.1370E+01
	VERT:	-.1608E-05	-.1626E-05	-.1303E-05	-.1322E-05	-.1227E-05	-.1018E-05	-.1150E-05	-.9412E-06	-.8431E-06

ROW 4	HORZ:	0.1370E+01	0.1370E+01	0.1370E+01	0.1370E+01	0.1370E+01	0.1370E+01	0.1370E+01	0.1370E+01	0.1370E+01
	VERT:	-.1626E-05	-.1303E-05	-.1322E-05	-.1227E-05	-.1018E-05	-.1150E-05	-.9412E-06	-.8431E-06	-.1141E-05
ROW 3	HORZ:	0.1370E+01	0.1370E+01	0.1370E+01	0.1370E+01	0.1370E+01	0.1370E+01	0.1370E+01	0.1370E+01	0.1370E+01
	VERT:	-.5359E-06	-.6181E-06	-.3584E-06	-.4407E-06	-.4089E-06	-.2631E-06	-.4595E-06	-.3138E-06	-.2810E-06
ROW 2	HORZ:	0.1370E+01	0.1370E+01	0.1370E+01	0.1370E+01	0.1370E+01	0.1370E+01	0.1370E+01	0.1370E+01	0.1370E+01
	VERT:	-.6181E-06	-.3584E-06	-.4407E-06	-.4089E-06	-.2631E-06	-.4595E-06	-.3138E-06	-.2810E-06	-.4681E-06
ROW 1	HORZ:	0.1370E+01	0.1370E+01	0.1370E+01	0.1370E+01	0.1370E+01	0.1370E+01	0.1370E+01	0.1370E+01	0.1370E+01
	VERT:	0.6181E-06	0.3584E-06	0.4407E-06	0.4089E-06	0.2631E-06	0.4595E-06	0.3138E-06	0.2810E-06	0.4681E-06

	COLUMN:	37	38	39	40	41	42	43	44	45
ROW 33	HORZ:	0.2396E+01	0.2365E+01	0.2132E+01	0.2093E+01	0.2079E+01	0.2009E+01	0.1579E+01	0.1619E+01	0.3383E+01
	VERT:	-.3317E-04	-.3415E-03	-.2515E-02	-.4313E-03	-.1522E-03	-.7532E-03	-.4657E-02	0.4358E-03	0.1909E-01
ROW 32	HORZ:	0.2397E+01	0.2366E+01	0.2131E+01	0.2092E+01	0.2079E+01	0.2012E+01	0.1575E+01	0.1604E+01	0.2801E+01
	VERT:	-.3415E-03	-.2515E-02	-.4313E-03	-.1522E-03	-.7532E-03	-.4657E-02	0.4358E-03	0.1909E-01	0.7725E+00
ROW 31	HORZ:	0.2397E+01	0.2366E+01	0.2131E+01	0.2092E+01	0.2079E+01	0.2012E+01	0.1575E+01	0.1604E+01	0.2801E+01
	VERT:	-.1013E-03	-.9871E-03	-.7615E-02	-.1264E-02	-.4363E-03	-.2210E-02	-.1412E-01	0.1077E-02	0.4500E-01
ROW 30	HORZ:	0.2397E+01	0.2372E+01	0.2126E+01	0.2092E+01	0.2081E+01	0.2021E+01	0.1563E+01	0.1570E+01	0.2332E+01
	VERT:	-.9871E-03	-.7615E-02	-.1264E-02	-.4363E-03	-.2210E-02	-.1412E-01	0.1077E-02	0.4500E-01	0.6512E+00
ROW 29	HORZ:	0.2397E+01	0.2372E+01	0.2126E+01	0.2092E+01	0.2081E+01	0.2021E+01	0.1563E+01	0.1570E+01	0.2332E+01
	VERT:	-.1497E-03	-.1549E-02	-.1293E-01	-.2004E-02	-.6714E-03	-.3508E-02	-.2403E-01	0.1241E-02	0.6147E-01
ROW 28	HORZ:	0.2398E+01	0.2380E+01	0.2117E+01	0.2091E+01	0.2083E+01	0.2037E+01	0.1543E+01	0.1524E+01	0.1954E+01
	VERT:	-.1549E-02	-.1293E-01	-.2004E-02	-.6714E-03	-.3508E-02	-.2403E-01	0.1241E-02	0.6147E-01	0.5504E+00
ROW 27	HORZ:	0.2398E+01	0.2380E+01	0.2117E+01	0.2091E+01	0.2083E+01	0.2037E+01	0.1543E+01	0.1524E+01	0.1954E+01
	VERT:	-.1643E-03	-.1951E-02	-.1861E-01	-.2583E-02	-.8424E-03	-.4499E-02	-.3472E-01	0.8285E-03	0.7078E-01
ROW 26	HORZ:	0.2400E+01	0.2393E+01	0.2105E+01	0.2089E+01	0.2086E+01	0.2060E+01	0.1516E+01	0.1470E+01	0.1649E+01
	VERT:	-.1951E-02	-.1861E-01	-.2583E-02	-.8424E-03	-.4499E-02	-.3472E-01	0.8285E-03	0.7078E-01	0.4656E+00
ROW 25	HORZ:	0.2400E+01	0.2393E+01	0.2105E+01	0.2089E+01	0.2086E+01	0.2060E+01	0.1516E+01	0.1470E+01	0.1649E+01
	VERT:	-.1705E-03	-.2078E-02	-.2486E-01	-.2924E-02	-.9119E-03	-.5051E-02	-.4650E-01	-.1714E-03	0.7469E-01
ROW 24	HORZ:	0.2401E+01	0.2411E+01	0.2088E+01	0.2088E+01	0.2089E+01	0.2092E+01	0.1480E+01	0.1412E+01	0.1402E+01
	VERT:	-.2078E-02	-.2486E-01	-.2924E-02	-.9119E-03	-.5051E-02	-.4650E-01	-.1714E-03	0.7469E-01	0.3943E+00
ROW 23	HORZ:	0.2401E+01	0.2411E+01	0.2088E+01	0.2088E+01	0.2089E+01	0.2092E+01	0.1480E+01	0.1412E+01	0.1402E+01
	VERT:	-.1476E-03	-.1856E-02	-.3186E-01	-.2931E-02	-.8729E-03	-.4990E-02	-.5976E-01	-.1645E-02	0.7446E-01
ROW 22	HORZ:	0.2403E+01	0.2434E+01	0.2066E+01	0.2086E+01	0.2092E+01	0.2135E+01	0.1435E+01	0.1353E+01	0.1202E+01
	VERT:	-.1856E-02	-.3186E-01	-.2931E-02	-.8729E-03	-.4990E-02	-.5976E-01	-.1645E-02	0.7446E-01	0.3337E+00
ROW 21	HORZ:	0.2403E+01	0.2434E+01	0.2066E+01	0.2086E+01	0.2092E+01	0.2135E+01	0.1435E+01	0.1353E+01	0.1202E+01
	VERT:	-.7913E-04	-.1186E-02	-.3983E-01	-.2489E-02	-.7475E-03	-.4060E-02	-.7489E-01	-.3415E-02	0.7119E-01
ROW 20	HORZ:	0.2403E+01	0.2464E+01	0.2037E+01	0.2085E+01	0.2095E+01	0.2189E+01	0.1380E+01	0.1295E+01	0.1039E+01
	VERT:	-.1186E-02	-.3983E-01	-.2489E-02	-.7475E-03	-.4060E-02	-.7489E-01	-.3415E-02	0.7119E-01	0.2816E+00

ROW 19	HORZ:	0.4807E-03	0.4928E-03	0.2037E+01	0.2085E+01	0.2095E+01	0.2189E+01	0.1380E+01	0.1295E+01	0.1039E+01
	VERT:	-.3623E-04	-.5441E-03	-.4477E-01	-.1451E-02	-.5373E-03	-.2006E-02	-.9243E-01	-.5245E-02	0.6564E-01
ROW 18	HORZ:	0.5906E-03	0.3820E-03	0.2003E+01	0.2084E+01	0.2096E+01	0.2259E+01	0.1313E+01	0.1241E+01	0.9070E+00
	VERT:	-.5441E-03	-.3198E-04	-.1451E-02	-.5373E-03	-.2006E-02	-.9243E-01	-.5245E-02	0.6564E-01	0.2366E+00
ROW 17	HORZ:	0.5906E-03	0.3820E-03	0.4007E-03	0.4168E-03	0.4192E-03	0.4519E-03	0.1313E+01	0.1241E+01	0.9070E+00
	VERT:	-.5740E-04	-.5485E-03	-.7279E-03	-.5774E-03	-.4096E-03	-.2429E-03	-.1768E+00	-.6803E-02	0.5843E-01
ROW 16	HORZ:	0.6969E-03	0.4208E-03	0.3681E-03	0.3805E-03	0.3831E-03	0.4266E-03	0.1181E+01	0.1190E+01	0.7996E+00
	VERT:	-.5485E-03	-.7279E-03	-.5774E-03	-.4096E-03	-.2429E-03	-.1263E-03	-.6803E-02	0.5843E-01	0.1974E+00
ROW 15	HORZ:	0.6969E-03	0.4208E-03	0.3681E-03	0.3805E-03	0.3831E-03	0.4266E-03	0.1181E+01	0.1190E+01	0.7996E+00
	VERT:	-.2728E-04	-.5545E-03	-.7290E-03	-.5771E-03	-.4095E-03	-.2420E-03	-.1257E+00	-.6601E-02	0.4996E-01
ROW 14	HORZ:	0.8110E-03	0.4585E-03	0.3352E-03	0.3442E-03	0.3469E-03	0.3937E-03	0.1089E+01	0.1147E+01	0.7124E+00
	VERT:	-.5545E-03	-.7290E-03	-.5771E-03	-.4095E-03	-.2420E-03	-.8981E-04	-.6601E-02	0.4996E-01	0.1628E+00
ROW 13	HORZ:	0.8110E-05	0.4585E-03	0.3352E-03	0.3442E-03	0.3469E-03	0.3937E-03	0.8712E+00	0.9173E+00	0.5699E+00
	VERT:	-.4871E-04	-.1106E-02	-.7317E-03	-.5769E-03	-.4095E-03	-.2410E-03	-.8341E-01	-.5478E-02	0.4151E-01
ROW 12	HORZ:	-.3923E-07	0.3776E-03	0.3017E-03	0.3080E-03	0.3104E-03	0.3418E-03	0.8703E+00	0.9167E+00	0.5688E+00
	VERT:	-.1106E-04	-.7317E-03	-.5769E-03	-.4095E-03	-.2410E-03	-.1192E-05	-.5478E-02	0.4151E-01	0.1350E+00
ROW 11	HORZ:	-.3923E-05	0.3776E-03	0.3017E-03	0.3080E-03	0.3104E-03	0.3418E-03	0.8703E+00	0.9167E+00	0.5688E+00
	VERT:	-.9853E-05	-.5452E-03	-.7334E-03	-.5768E-03	-.4094E-03	-.2403E-03	-.4576E-01	-.4473E-02	0.3398E-01
ROW 10	HORZ:	0.1119E-03	0.4183E-03	0.2678E-03	0.2718E-03	0.2738E-03	0.2899E-03	0.8698E+00	0.9162E+00	0.5678E+00
	VERT:	-.5452E-03	-.7334E-03	-.5768E-03	-.4094E-03	-.2403E-03	-.6537E-06	-.4473E-02	0.3398E-01	0.1104E+00
ROW 9	HORZ:	0.1119E-03	0.4183E-03	0.2678E-03	0.2718E-03	0.2738E-03	0.2899E-03	0.8698E+00	0.9162E+00	0.5678E+00
	VERT:	-.5038E-05	-.5386E-03	-.7366E-03	-.5767E-03	-.4094E-03	-.2399E-03	-.8125E-02	-.3468E-02	0.2644E-01
ROW 8	HORZ:	0.2274E-03	0.4612E-03	0.2332E-03	0.2355E-03	0.2371E-03	0.2380E-03	0.8697E+00	0.9158E+00	0.5671E+00
	VERT:	-.5386E-03	-.7366E-03	-.5767E-03	-.4094E-03	-.2399E-03	-.1161E-06	-.3468E-02	0.2644E-01	0.8583E-01
ROW 7	HORZ:	0.2274E-03	0.4612E-03	0.9330E+00	0.9421E+00	0.9484E+00	0.9522E+00	0.8697E+00	0.9158E+00	0.5671E+00
	VERT:	-.1310E-05	-.5335E-03	0.1870E-01	-.4772E-03	-.3411E-03	-.1993E-03	0.4453E-02	-.2469E-02	0.1889E-01
ROW 6	HORZ:	0.3426E-03	0.3457E-03	0.9332E+00	0.9421E+00	0.9484E+00	0.9521E+00	0.8698E+00	0.9156E+00	0.5666E+00
	VERT:	-.5335E-03	0.2672E-06	-.4772E-03	-.3411E-03	-.1993E-03	0.4453E-02	-.2469E-02	0.1889E-01	0.6128E-01
ROW 5	HORZ:	0.1370E+01	0.1383E+01	0.9332E+00	0.9421E+00	0.9484E+00	0.9521E+00	0.8698E+00	0.9156E+00	0.5666E+00
	VERT:	-.1141E-05	-.3983E-03	0.1458E-01	-.2836E-03	-.2045E-03	-.1192E-03	0.2671E-02	-.1479E-02	0.1134E-01
ROW 4	HORZ:	0.1370E+01	0.1383E+01	0.9334E+00	0.9421E+00	0.9484E+00	0.9521E+00	0.8698E+00	0.9154E+00	0.5662E+00
	VERT:	-.3983E-03	0.1458E-01	-.2836E-03	-.2045E-03	-.1192E-03	0.2671E-02	-.1479E-02	0.1134E-01	0.3676E-01
ROW 3	HORZ:	0.1370E+01	0.1383E+01	0.9334E+00	0.9421E+00	0.9484E+00	0.9521E+00	0.8698E+00	0.9154E+00	0.5662E+00
	VERT:	-.4681E-06	-.1322E-03	0.4859E-02	-.9408E-04	-.6812E-04	-.3971E-04	0.8900E-03	-.4924E-03	0.3779E-02
ROW 2	HORZ:	0.1370E+01	0.1383E+01	0.9334E+00	0.9421E+00	0.9484E+00	0.9521E+00	0.8699E+00	0.9154E+00	0.5661E+00
	VERT:	-.1322E-03	0.4859E-02	-.9408E-04	-.6812E-04	-.3971E-04	0.8900E-03	-.4924E-03	0.3779E-02	0.1225E-01
ROW 1	HORZ:	0.1370E+01	0.1383E+01	0.9334E+00	0.9421E+00	0.9484E+00	0.9521E+00	0.8699E+00	0.9154E+00	0.5661E+00
	VERT:	0.1322E-03	-.4859E-02	0.9408E-04	0.6812E-04	0.3971E-04	-.8900E-03	0.4924E-03	-.3779E-02	-.1225E-01

COLUMN: 46

ROW 33	HORZ:	-.3383E+01
	VERT:	0.1909E-01
ROW 32	HORZ:	-.2801E+01
	VERT:	0.7725E+00
ROW 31	HORZ:	-.2801E+01
	VERT:	0.4500E-01
ROW 30	HORZ:	-.2332E+01
	VERT:	0.6512E+00
ROW 29	HORZ:	-.2332E+01
	VERT:	0.6147E-01
ROW 28	HORZ:	-.1954E+01
	VERT:	0.5504E+00
ROW 27	HORZ:	-.1954E+01
	VERT:	0.7078E-01
ROW 26	HORZ:	-.1649E+01
	VERT:	0.4656E+00
ROW 25	HORZ:	-.1649E+01
	VERT:	0.7469E-01
ROW 24	HORZ:	-.1402E+01
	VERT:	0.3943E+00
ROW 23	HORZ:	-.1402E+01
	VERT:	0.7446E-01
ROW 22	HORZ:	-.1202E+01
	VERT:	0.3337E+00
ROW 21	HORZ:	-.1202E+01
	VERT:	0.7119E-01
ROW 20	HORZ:	-.1039E+01
	VERT:	0.2816E+00
ROW 19	HORZ:	-.1039E+01
	VERT:	0.6564E-01
ROW 18	HORZ:	-.9070E+00
	VERT:	0.2366E+00
ROW 17	HORZ:	-.9070E+00
	VERT:	0.5843E-01
ROW 16	HORZ:	-.7996E+00
	VERT:	0.1974E+00

ROW 15	HORZ:	-.7996E+00
	VERT:	0.4996E-01
ROW 14	HORZ:	-.7124E+00
	VERT:	0.1628E+00
ROW 13	HORZ:	-.5699E+00
	VERT:	0.4151E-01
ROW 12	HORZ:	-.5688E+00
	VERT:	0.1350E+00
ROW 11	HORZ:	-.5688E+00
	VERT:	0.3398E-01
ROW 10	HORZ:	-.5678E+00
	VERT:	0.1104E+00
ROW 9	HORZ:	-.5678E+00
	VERT:	0.2644E-01
ROW 8	HORZ:	-.5671E+00
	VERT:	0.8583E-01
ROW 7	HORZ:	-.5671E+00
	VERT:	0.1889E-01
ROW 6	HORZ:	-.5666E+00
	VERT:	0.6128E-01
ROW 5	HORZ:	-.5666E+00
	VERT:	0.1134E-01
ROW 4	HORZ:	-.5662E+00
	VERT:	0.3676E-01
ROW 3	HORZ:	-.5662E+00
	VERT:	0.3779E-02
ROW 2	HORZ:	-.5661E+00
	VERT:	0.1225E-01
ROW 1	HORZ:	-.5661E+00
	VERT:	-.1225E-01

TIME FOR PARTICLES TO LEAVE EACH CELL
(ALL VALUES EXPRESSED AS ANTILOG BASE 10)

COLUMN:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
	3.5	3.2	3.3	3.0	2.9	3.0	3.0	3.3	3.3	3.2	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.1	3.1	3.2	3.2	3.2
	3.7	3.3	3.6	3.2	2.9	3.0	3.2	3.5	3.3	3.3	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.2	3.2	3.2	3.2	3.2
	8.5	3.4	3.3	5.4	5.5	2.9	3.3	3.7	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.3	3.2	3.2	3.2	3.2
	8.5	3.6	3.2	5.4	5.4	3.0	3.3	3.7	3.6	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.3	3.2	3.2	3.2	3.2
	8.5	9.2	3.3	3.4	5.0	5.0	3.3	3.7	3.7	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.3	3.2	3.2	3.2	3.2
	8.5	9.2	3.5	3.2	5.0	4.6	4.9	3.5	3.6	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.3	3.2	3.2	3.2	3.2
	8.6	9.0	9.4	3.1	5.0	4.6	4.9	3.7	3.6	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.3	3.2	3.2	3.2	3.2
	8.6	9.1	9.4	3.4	3.4	4.8	4.5	4.7	5.1	5.4	5.8	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.0	6.9	6.9	9.2	6.9
	8.7	9.1	9.1	9.2	3.2	3.6	4.8	4.7	5.1	5.2	7.1	7.1	7.2	7.5	7.5	7.7	7.8	8.1	8.6	8.9	8.4	7.8	7.1	6.5
	8.8	9.2	9.1	9.3	3.5	3.3	4.8	4.7	5.1	5.2	7.1	7.1	7.2	7.5	7.5	7.7	7.8	8.1	8.6	8.9	8.4	7.8	7.1	6.5
	8.8	9.3	9.2	9.0	9.1	3.3	3.6	5.3	5.1	5.3	7.1	7.1	7.2	7.5	7.5	7.7	7.8	8.1	8.6	9.0	8.4	7.8	7.1	6.5
	8.9	9.3	9.3	9.1	9.1	3.5	3.3	5.3	5.1	5.4	5.8	7.0	7.7	7.5	7.5	7.7	7.8	8.1	8.6	9.0	8.4	7.7	7.1	6.5
	9.0	9.4	9.4	9.3	9.1	9.3	3.1	5.3	5.1	5.4	5.8	6.9	7.8	7.5	7.5	7.7	7.8	8.1	8.6	9.0	8.4	7.7	7.1	6.5
	9.2	9.5	9.4	9.3	9.1	9.3	3.6	3.1	3.1	3.6	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	8.3	7.0
	9.4	9.5	9.4	9.3	9.1	9.3	9.0	8.7	8.7	3.3	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	2.4	3.4
	9.7	9.5	9.4	9.3	9.1	9.3	9.3	8.7	8.7	3.6	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	2.4	3.4

COLUMN:	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.3	3.3	2.3
	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.3	3.3	2.3
	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.3	3.4	2.4
	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.4	3.3	2.4
	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.4	3.3	2.5
	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.4	3.3	2.6
	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.3	3.3	2.6
	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.6	5.4	5.4	3.2	3.2	3.2	3.2	3.2	3.4	2.7
	6.5	6.5	6.6	6.6	6.6	6.6	6.7	6.7	6.8	6.8	7.1	5.4	5.1	5.1	5.2	5.4	5.6	2.9	3.5	2.8
	6.5	6.5	6.6	6.6	6.6	6.6	6.7	6.7	6.8	6.8	7.1	5.4	5.1	5.1	5.2	5.4	5.7	3.1	3.5	2.8
	6.5	6.5	6.6	6.6	6.6	6.6	6.7	6.7	6.8	6.8	6.4	6.4	4.9	5.1	5.2	5.4	5.8	3.2	3.6	2.9
	6.5	6.5	6.6	6.6	6.6	6.6	6.7	6.7	6.8	6.8	7.1	5.4	5.1	5.1	5.2	5.4	5.8	3.5	3.6	3.0
	6.5	6.5	6.6	6.6	6.6	6.6	6.7	6.7	6.8	6.8	7.1	5.4	5.1	5.1	5.2	5.4	5.8	3.6	3.6	3.1
	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	5.4	5.4	3.6	3.6	3.6	3.6	3.6	3.6	3.3
	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.6	3.6	3.6	3.6	3.6	3.6	3.5
	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.6	3.6	3.6	3.6	3.6	3.6	3.8

**** BEGIN SIMULATION ****

ELASPED TIME IN YEARS: 50000.00

TOTAL NUMBER OF PARTICLES ADDED: 100

100 PARTICLES ADDED AT ROW 6, COLUMN 16

DISTRIBUTION OF NON-MOVING REFERENCE PARTICLES

0 OUT OF 100 PARTICLES HAVE LEFT THE CONFINING BED

0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.

ELASPED TIME IN YEARS: 100000.00

TOTAL NUMBER OF PARTICLES ADDED: 200

100 PARTICLES ADDED AT ROW 6, COLUMN 16

DISTRIBUTION OF NON-MOVING REFERENCE PARTICLES

3 OUT OF 200 PARTICLES HAVE LEFT THE CONFINING BED

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

ELASPED TIME IN YEARS: 150000.00

TOTAL NUMBER OF PARTICLES ADDED: 300

100 PARTICLES ADDED AT ROW 6, COLUMN 16

DISTRIBUTION OF NON-MOVING REFERENCE PARTICLES

10 OUT OF 300 PARTICLES HAVE LEFT THE CONFINING BED

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

ELASPED TIME IN YEARS: 200000.00

TOTAL NUMBER OF PARTICLES ADDED: 400

100 PARTICLES ADDED AT ROW 6, COLUMN 16

DISTRIBUTION OF NON-MOVING REFERENCE PARTICLES

32 OUT OF 400 PARTICLES HAVE LEFT THE CONFINING BED

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	29.	1.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	2.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	C.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

ELASPED TIME IN YEARS: 250000.00

TOTAL NUMBER OF PARTICLES ADDED: 500

100 PARTICLES ADDED AT ROW 6, COLUMN 16

DISTRIBUTION OF NON-MOVING REFERENCE PARTICLES

55 OUT OF 500 PARTICLES HAVE LEFT THE CONFINING BED

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	50.	1.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	3.	1.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

ELASPED TIME IN YEARS: 250000.00

DISTRIBUTION OF REFERENCE PARTICLES

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	2.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	16.	69.	170.	116.	58.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	6.	4.	4.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

ELASPED TIME IN YEARS: 250000.00

CONCENTRATION DISTRIBUTION

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

ELASPED TIME IN YEARS: 300000.00

TOTAL NUMBER OF PARTICLES ADDED: 600

100 PARTICLES ADDED AT ROW 6, COLUMN 16

DISTRIBUTION OF NON-MOVING REFERENCE PARTICLES

77 OUT OF 600 PARTICLES HAVE LEFT THE CONFINING BED

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	70.	3.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	3.	1.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

ELASPED TIME IN YEARS: 350000.00

TOTAL NUMBER OF PARTICLES ADDED: 700

100 PARTICLES ADDED AT ROW 6, COLUMN 16

DISTRIBUTION OF NON-MOVING REFERENCE PARTICLES

108 OUT OF 700 PARTICLES HAVE LEFT THE CONFINING BED

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

ELASPED TIME IN YEARS: 400000.00

TOTAL NUMBER OF PARTICLES ADDED: 800

100 PARTICLES ADDED AT ROW 6, COLUMN 16

DISTRIBUTION OF NON-MOVING REFERENCE PARTICLES

150 OUT OF 800 PARTICLES HAVE LEFT THE CONFINING BED

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

ELASPED TIME IN YEARS: 450000.00

TOTAL NUMBER OF PARTICLES ADDED: 900

100 PARTICLES ADDED AT ROW 6, COLUMN 16

DISTRIBUTION OF NON-MOVING REFERENCE PARTICLES

195 OUT OF 900 PARTICLES HAVE LEFT THE CONFINING BED

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	8.	0.	0.	0.	0.	0.	158.	13.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	12.	4.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

ELASPED TIME IN YEARS: 500000.00

TOTAL NUMBER OF PARTICLES ADDED: 1000

100 PARTICLES ADDED AT ROW 6, COLUMN 16

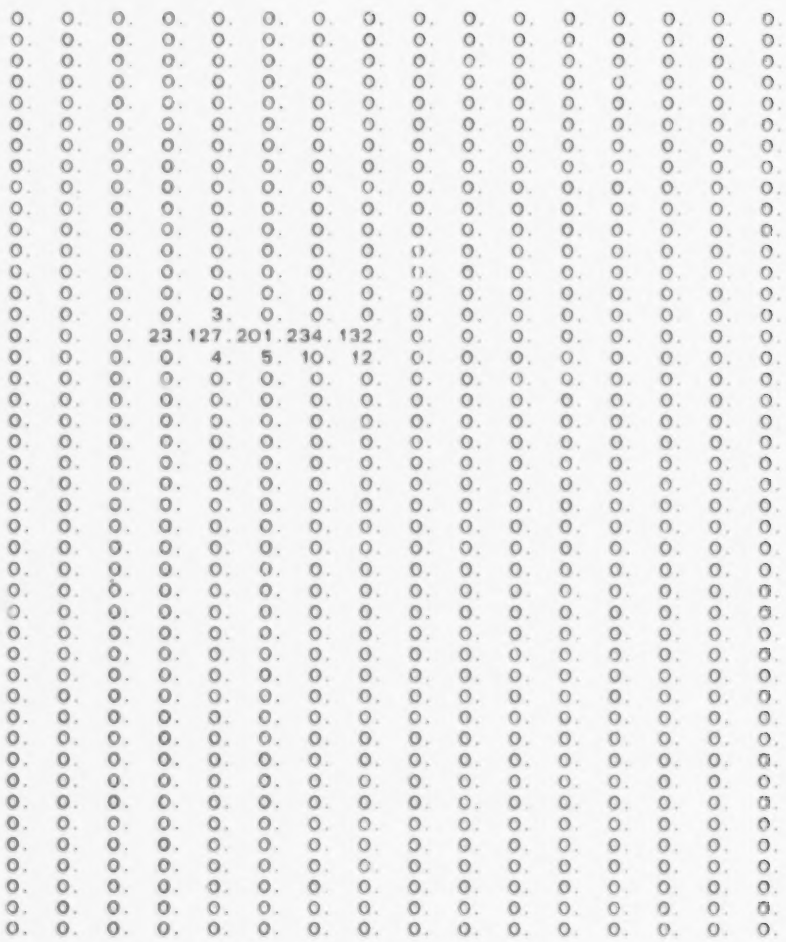
DISTRIBUTION OF NON-MOVING REFERENCE PARTICLES

249 OUT OF 1000 PARTICLES HAVE LEFT THE CONFINING BED

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

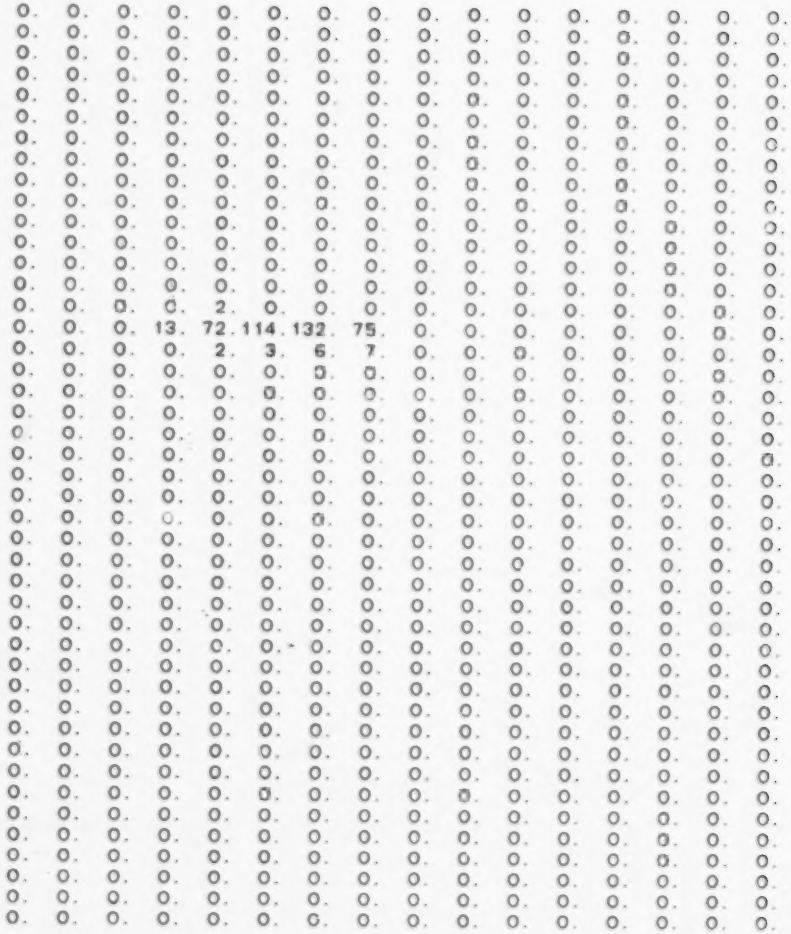
ELASPED TIME IN YEARS 500000.00

DISTRIBUTION OF REFERENCE PARTICLES



ELASPED TIME IN YEARS: 500000.00

CONCENTRATION DISTRIBUTION



ELASPED TIME IN YEARS: 550000.00

TOTAL NUMBER OF PARTICLES ADDED: 1100

100 PARTICLES ADDED AT ROW 6, COLUMN 16

DISTRIBUTION OF NON-MOVING REFERENCE PARTICLES

307 OUT OF 1100 PARTICLES HAVE LEFT THE CONFINING BED

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

ELASPED TIME IN YEARS: 600000.00

TOTAL NUMBER OF PARTICLES ADDED: 1200

100 PARTICLES ADDED AT ROW 6, COLUMN 16

DISTRIBUTION OF NON-MOVING REFERENCE PARTICLES

368 OUT OF 1200 PARTICLES HAVE LEFT THE CONFINING BED

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

ELASPED TIME IN YEARS: 650000.00

TOTAL NUMBER OF PARTICLES ADDED: 1300

100 PARTICLES ADDED AT ROW 6, COLUMN 16

DISTRIBUTION OF NON-MOVING REFERENCE PARTICLES

437 OUT OF 1300 PARTICLES HAVE LEFT THE CONFINING BED

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

ELASPED TIME IN YEARS: 700000.00

TOTAL NUMBER OF PARTICLES ADDED: 1400

100 PARTICLES ADDED AT ROW 6, COLUMN 16

DISTRIBUTION OF NON-MOVING REFERENCE PARTICLES

500 OUT OF 1400 PARTICLES HAVE LEFT THE CONFINING BED

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.

ELASPED TIME IN YEARS: 749999.31

TOTAL NUMBER OF PARTICLES ADDED: 1500

100 PARTICLES ADDED AT ROW 6, COLUMN 16

DISTRIBUTION OF NON-MOVINC REFERENCE PARTICLES

578 OUT OF 1500 PARTICLES HAVE LEFT THE CONFINING BED

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

ELASPED TIME IN YEARS: 749999.31

DISTRIBUTION OF REFERENCE PARTICLES

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

ELASPED TIME IN YEARS: 749999.31

CONCENTRATION DISTRIBUTION

0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.
0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.
0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.
0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.
0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.
0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.
0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.
0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.
0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.
0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.
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0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.
0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.
0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.
0. 0. 0. 1. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.
0. 0. 0. 24. 82. 147. 159. 80. 0. 0. 0. 0. 0. 0. 0. 0.
0. 0. 0. 2. 2. 3. 14. 9. 0. 0. 0. 0. 0. 0. 0. 0.
0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.
0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.
0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.
0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.
0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.
0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.
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0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.
0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.
0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.
0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.
0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.
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0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.
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0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.
0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.
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0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.
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0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.
0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.
0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.
0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.
0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.

ELASPED TIME IN YEARS: 799999.25

TOTAL NUMBER OF PARTICLES ADDED: 1600

100 PARTICLES ADDED AT ROW 6, COLUMN 16

DISTRIBUTION OF NON-MOVING REFERENCE PARTICLES

642 OUT OF 1600 PARTICLES HAVE LEFT THE CONFINING BED

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	2.	48.	0.	0.	0.	0.	0.	452.	45.	0.	0.	0.	0.	0.	0.
0.	1.	4.	0.	0.	0.	0.	0.	74.	16.	0.	0.	0.	0.	0.	0.
0.	0.	0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

ELASPED TIME IN YEARS: 849999.25

TOTAL NUMBER OF PARTICLES ADDED: 1700

100 PARTICLES ADDED AT ROW 6, COLUMN 16

DISTRIBUTION OF NON-MOVING REFERENCE PARTICLES

715 OUT OF 1700 PARTICLES HAVE LEFT THE CONFINING BED

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

ELASPED TIME IN YEARS: 899999.19

TOTAL NUMBER OF PARTICLES ADDED: 1800

100 PARTICLES ADDED AT ROW 6, COLUMN 16

DISTRIBUTION OF NON-MOVING REFERENCE PARTICLES

814 OUT OF 1800 PARTICLES HAVE LEFT THE CONFINING BED

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

ELASPED TIME IN YEARS: 949999.13

TOTAL NUMBER OF PARTICLES ADDED: 1900

100 PARTICLES ADDED AT ROW 6, COLUMN 16

DISTRIBUTION OF NON-MOVING REFERENCE PARTICLES

902 OUT OF 1900 PARTICLES HAVE LEFT THE CONFINING BED

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	2.	69.	0.	0.	0.	0.	0.	650.	55.	0.	0.	0.	0.	0.	0.
0.	1.	5.	0.	0.	0.	0.	0.	98.	22.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

ELASPED TIME IN YEARS: 999999.06

TOTAL NUMBER OF PARTICLES ADDED: 2000

100 PARTICLES ADDED AT ROW 6, COLUMN 16

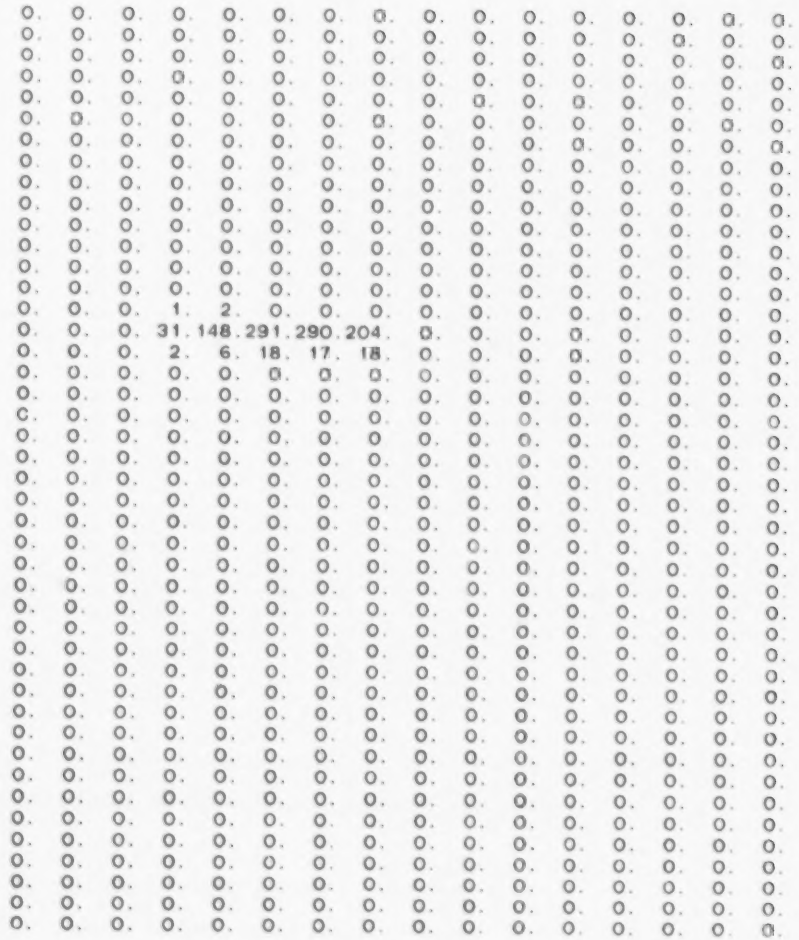
DISTRIBUTION OF NON-MOVING REFERENCE PARTICLES

972 OUT OF 2000 PARTICLES HAVE LEFT THE CONFINING BED

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

ELASPED TIME IN YEARS: 999999.08

DISTRIBUTION OF REFERENCE PARTICLES



ELASPED TIME IN YEARS: 999999.0G

CONCENTRATION DISTRIBUTION

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	1.	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	18.	84.	165.	164.	115.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	1.	3.	10.	10.	10.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

ELASPED TIME IN YEARS: 1049999.00

TOTAL NUMBER OF PARTICLES ADDED: 2100

100 PARTICLES ADDED AT ROW 6, COLUMN 16

DISTRIBUTION OF NON-MOVING REFERENCE PARTICLES

1056 OUT OF 2100 PARTICLES HAVE LEFT THE CONFINING BED

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0
0.	2.	77.	0.	0.	0.	0.	0.	766.	65.	0.	0.	0.	0.	0.	0.
0.	1.	6.	0.	0.	0.	0.	0.	114.	25.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
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0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
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0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

ELASPED TIME IN YEARS: 1099999.00

TOTAL NUMBER OF PARTICLES ADDED: 2200

100 PARTICLES ADDED AT ROW 6, COLUMN 16

DISTRIBUTION OF NON-MOVING REFERENCE PARTICLES

1142 OUT OF 2200 PARTICLES HAVE LEFT THE CONFINING BED

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

ELASPED TIME IN YEARS: 1149998.00

TOTAL NUMBER OF PARTICLES ADDED: 2300

100 PARTICLES ADDED AT ROW 6, COLUMN 16

DISTRIBUTION OF NON-MOVING REFERENCE PARTICLES

1234 OUT OF 2300 PARTICLES HAVE LEFT THE CONFINING BED

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

ELASPED TIME IN YEARS: 1199998.00

TOTAL NUMBER OF PARTICLES ADDED: 2400

100 PARTICLES ADDED AT ROW 6, COLUMN 16

DISTRIBUTION OF NON-MOVING REFERENCE PARTICLES

1328 OUT OF 2400 PARTICLES HAVE LEFT THE CONFINING BED

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

ELASPED TIME IN YEARS: 1249998.00

TOTAL NUMBER OF PARTICLES ADDED: 2500

100 PARTICLES ADDED AT ROW 6, COLUMN 16

DISTRIBUTION OF NON-MOVING REFERENCE PARTICLES

1419 OUT OF 2500 PARTICLES HAVE LEFT THE CONFINING BED

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

ELASPED TIME IN YEARS: 1249998.00

DISTRIBUTION OF REFERENCE PARTICLES

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

ELASPED TIME IN YEARS: 1249998.00

CONCENTRATION DISTRIBUTION

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	23.	84.	160.	189.	107.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	1.	5.	10.	19.	15.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
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0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
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0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

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This manual describes a deterministic-probabilistic contaminant transport (DPCT) computer model designed to simulate mass transfer by ground-water movement in a vertical section of the earth's crust. The model can account for convection, dispersion, radioactive decay, and cation exchange for a single component. A velocity is calculated from the convective transport of the ground water for each reference particle in the modeled region; dispersion is accounted for in the particle motion by adding a random component to the deterministic motion. The model is sufficiently general to enable the user to specify virtually any type of water table or geologic configuration, and a variety of boundary conditions. A major emphasis in the model development has been placed on making the model simple to use, and information provided in the User Manual will permit changes to the computer code to be made relatively easily for those that might be required for specific applications.

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